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SCIENCE OF RELIGION

DANIEL A. SIMMONS

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The Science of Religion.

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The Science of Religion

Fundamental Faiths Expressed
in Modern Terms

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By
DANIEL A. SIMMONS
Judge of the Circuit Court, Jacksonville, Florida

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Preface

THE most important question in the world is propounded in the book of Job, which book is probably the oldest piece of literature now known to mankind. The question was doubtless hoary with age even in the remote days of Job, and the onward march of evolution and education has constantly accentuated it. Here it is: "If a man die, shall he live again?"

If it be a fact that men and women continue to live as self-conscious individuals after the death of the physical body, that one fact is of more vital and tremendous importance to mankind than all the other facts of nature taken together. It is, always has been, and ever must be, the one theme in which a death-shadowed race is more keenly interested than in any other. If interest seems sometimes to abate, it is merely because men and women have despaired of getting a satisfactory answer. The world-old question is always there, looming up like a mountain range on the mental horizon, though attention is sometimes momentarily detracted from it.

The importance of the question raises to a place of immediate and vital interest any dependable collection of established facts which in any way tends to answer it. The world so urgently needs

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the answer! Human history is a record of the fluctuating issues of life and death. The expectation of death shapes all human activities and retards all human achievement. Doubt as to whether or not physical death ends individual existence affects every intelligent human being and shadows the lives of the noblest men and women.

The prospect of death influences individual acts and sits as an unbidden spectral guest in the counsels of nations. Death confronts us wherever we turn. It injects its virus into the heart of the germinating oak, breathes its withering breath upon the budding flower, and sets its seal upon the new-born child. Its sombre shadow falls across life's every pleasing prospect, and its skeleton hand adds a drop of gall to every cup of pleasure. It is a party to every human contract, and love's joys and privileges are held subject to its caprice. The fear of it springs up with every form of intelligent life, and remains until at last the quivering heart is still. Very few people have escaped its ravages. Nearly all have stood helplessly by and seen the last breath of a loved one gasped away, leaving the dear face pallid and expressionless, and the once winsome eyes glazed and immobile.

The certainty of physical death lashes all intelligent life into restlessness. It forces into men's minds an ever-present sense of the fleeting impermanency of all human accomplishment. It discourages purposeful living by bringing into every life the certain prospect of reaching the end. It

inflates the value of time, excites haste, and inspires a feverish and fitful struggle for immediate attainment and reward; entailing the bulk of the evils that afflict the human race.

These unhappy conditions are all either produced or accentuated by the uncertainty which obscures the issues of physical death. If men and women could only know, or even rationally believe, that there is no such thing as death, and that life here and hereafter has a common development and a common purpose, what rapid and radical changes would be wrought in human lives and affairs!

Human Intuition has always and everywhere whispered of a life beyond physical death, and this whispering is the master-tone of all religious beliefs. It holds religious organizations together; builds churches, mosques and temples; stimulates philanthropy; inspires morality; and gives men and women strength to meet the vicissitudes of life.

Intuition is supported and encouraged by the teachings of religion. But the teachings of religion come from a dead past and a vanished civilization. Religion is Oriental in its spirit and methods of treatment, and even its most modern Orientalism is nearly two thousand years old. Its methods were all-sufficing to the Oriental intelligence in the midst of which it had its birth, and if the numerous accounts are to be credited these methods led many men and women to actual spiritual knowledge and illumination whereby they received personal and conclusive proof of the existence of a realm of

super-physical matter and of the continuity of life after physical death. And, again, if these accounts are true, such proof was obtained through compliance with natural laws still in operation, because natural laws are changeless.

The truths of religion are, of course, unchanging, just as natural laws are unchanging; but the people of the western hemisphere have outgrown the ancient Oriental manner of expression and methods of treatment. The methods of thought and reasoning employed by western progressive intelligence in this age is almost the exact opposite of the methods of thought and reasoning employed by eastern intelligence two thousand years ago and more. And modern western intelligence demands methods of thought, expression and reasoning that will conform to itself and take into account its vastly augmented store of knowledge. Ancient eastern intelligence was idealistic, and demanded idealistic teaching. Modern western intelligence is practical and analytical, and demands practical and analytical teaching: it is rational and scientific, and must be met with rational and scientific explanations of the phenomena of life and death, or it cannot receive the teaching.

When Religion announces to modern western intelligence that God is Love, and asserts that He created the heaven and the earth and everything in them, it propounds an unsolved riddle in a dead language. Physical Science has proved to the satisfaction of the vast majority of our educated people

that the earth has tediously evolved from a mass of white-hot gases, and that its phenomena are governed by natural laws of uniform operation. Modern western intelligence therefore demands of Religion that it shall set forth and explain those principles, elements, laws and forces which will rationally and scientifically prove that God is Love, and show how such a God might move upon gaseous incandescence and evolve it into the teeming world of life and intelligence which we know today.

When Religion says, in this day and to this generation, "There is a natural body, and there is a spiritual body," coupled with an assertion that the spiritual body continues to live after the death of the other; it controverts the findings of an arrogant, all-conquering, miracle-working Physical Science which asserts that it has traced physical matter to its very ultimate without finding any place for soul or spirit, and clinches the argument with the axiom that two bodies cannot occupy the same space at the same time. The progressive intelligence of modern Europe and North America is demanding of Religion that it either challenge this finding of Physical Science by propounding those principles, properties and potencies of matter which will at least show that such dual existence is possible, or else withdraw its claims and leave men and women free to work out their own destiny.

In response to these rational and reasonable demands Religion produces a religious literature thou-

sands of years old, asserts that the mysteries of God and Immortality are past all human understanding, and exhorts to faith. This response, however honest, sincere and commendable it may be, does not meet the issue.

The net result of all this conflict and uncertainty is that, as a rule, the best intelligences in western civilization are either not in the churches, or else they are loosely affiliated with them as a matter of form and convention; leaving the active work to be carried on by mentally undersized zealots and ambitious seekers of place and power. This may seem blunt, and even inconsiderate; but its truth will be attested by any educated minister of reasonably wide experience. I say this condition prevails as a rule, and readily and gladly admit that there are many notable exceptions. These exceptions are noble and refined men and women whose intuition surmounts the difficulties and uncertainties that have been briefly set forth.

These are some of the big problems with which this book grapples, and the aim has been to lay hold of them at their gnarled and sturdy roots. Its chief purpose is to prove, through a collection and coördination of the mass of pertinent facts discovered by Physical Science, and a system of reasoning based upon those facts, that the real discoveries of Science and the fundamental teachings of Religion are harmonious and mutually supplemental. In order to intelligently carry out this purpose it has been found necessary to translate the

technical language with which Physical Science clothes the facts discovered by it into the every-day language of every-day men and women, so that people of average education and intelligence might readily understand it.

The book proclaims and describes a Universal Intelligent Force which it is hoped will at once conform to the scientist's conception of Natural Law, meet the religionist's idea of God, and reveal the First Cause which the evolutionist has been unable to discover. It attempts to show the utter irrelevancy of the scientific axiom that two bodies cannot occupy the same space at the same time, and points out an unexplored realm in the domain of matter where may lie a great world of spiritual material abounding in life and controlled by intelligence. Then additional evidence is brought forward tending to prove the actual existence of such a world, and its habitation by men, women and children clothed upon with the spiritual bodies the existence of which St. Paul asserts as a fact.

Other and collateral subjects are treated, as will appear by reference to the table of contents, but they all bear upon the two chief topics. The idea that morality is an exact science, and that one's acts and thoughts mechanically register their effects upon him, will be new to many readers. To some it may seem preposterous; but if so, then they are respectfully asked to suspend judgment until they have read the entire book in the sequence in which it is written.

Any effort to properly accredit the material which has been used would be worse than useless, because the sources are too many and too often unknown. It seems almost needless to say that the author is not entitled to credit for the many discoveries dealt with; not even for the ideas of a Universal God-Force and a world of super-physical matter. The material has been drawn from many sources and many ages; so that this book is but the humble channel into which many streams of knowledge converge, and from which it is hoped there may flow out a composite stream of thought running away to the River of Life.

Greetings of hearty sympathy and fraternal good will to the great men and women of science who are doing so much to alleviate human suffering, and to make the world better and happier. To the noble men and women of religion who are so unselfishly giving themselves and their substance in an effort to point out the way which leads onward and upward to the Light: Greetings of faith and hope and brotherly love.

D. A. S.

Jacksonville, Fla.

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"Unto you it is given to know the mysteries of the kingdom of God."

I

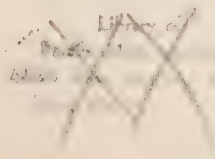
THE CRISIS AND THE CHALLENGE

FOR many years it has been generally supposed that Science and Religion are natural enemies and incapable of dwelling together in harmony. It seems to have been the consensus of opinion, shared by the votaries of both Science and Religion, that scientific discovery is hostile to religious belief. Science has insisted upon the accuracy of its findings, and Religion has contended for the sacredness of its beliefs.

When a scientific discovery has apparently conflicted with a religious belief, Religion has usually branded the announcement of the discovery as a sacrilege, and Science has brushed aside the belief as a superstition. These assertions are made as to Science and Religion in the aggregate sense, and with due allowance for many individual exceptions on both sides.

As a result of this conflict of authorities, there has come into the world a spiritual unrest which is at once a serious problem and a great opportunity for Religion.

Science has made its strongest appeal to the educated and highly intelligent, because its actual demonstrations are mathematically exact, and its



deductions are based upon critical analytical reasoning; and in the proportion that education and intelligence have increased, in just the same proportion has it strengthened its hold upon public opinion. Religion, on the other hand, has depended largely upon intuitions which have been common to all peoples, in all ages, and which intuitions it has sought to sustain and strengthen by the authority of various sacred writings passed along from a remote past. It has not been able to make any demonstrations, and most of its efforts at analytical reasoning have been failures. Those who have demanded a "sign" have been rebuked and turned away disappointed, and those who have made bold to ask, "How can these things be?" have been told that it is all a great mystery beyond the power of the human mind to comprehend.

PHYSICAL SCIENCE

In treating the subject in hand, the term "Science" is intended to mean Physical Science, because all the scientific discoveries which will hereafter be taken into account have been made upon the purely physical plane of life. And if Physical Science would confine its deductions and speculations to its own legitimate physical plane, upon which it operates and for which its implements are fashioned, it might be left to run its course. But, while all of its discoveries have been upon the physical plane, while its implements are fashioned for use only upon that plane, and while it has not

yet reached the ultimate of matter there existing, it has nevertheless indulged in speculations and propounded dogmas concerning things and conditions which lie altogether outside of and beyond physical things and conditions. The scientists have never seen an atom. They have seen the fiery trail of helium atoms passing through a vacuum under pressure of a high-tension electric current, but the atom itself they have never seen. While they know of the existence of atoms, and are acquainted with many of their manifestations and characteristics, they do not know of what they are composed and understand but very little about their structure.

But Science has not hesitated to assert, upon occasion, that there is nothing beyond the physical plane. The scientific gentlemen who make this assertion in such grave and erudite manner may be likened unto a man gazing upon a dimly seen mountain, beyond which he has never gone, upon the summit of which he has never stood, and solemnly asserting that the mountain top is the very limit of the universe. Valleys may actually lie beyond, with rills and rivers, and happy homes in which there are music and laughter and love; but he has never seen them, and therefore they do not exist: at the limit of his vision the earth rises up to meet the bending sky, and beyond that there is nothing else.

It is not proposed to thus briefly conclude the whole case against Science. Before any final judg-

ment can be justly and rationally reached we must first employ a delicate and difficult process of reasoning and coördination of facts. It is intended merely to challenge those scientists who assert that there is nothing beyond the physical, and that all life and action and intelligence are but phenomena of physical matter.

Science has been able to exactly demonstrate the correctness of many of its findings of physical fact, and to elucidate the causes lying behind many of its achievements. It has been able to give "signs" to the doubters, and its "miracles" have delighted and benefited the people of all lands. And those who see these signs and benefit by these miracles are not generally able to discriminate between the discoveries and deductions of Science in its legitimate realm and its dogmatic speculations concerning things which lie outside of that realm, of which latter it cannot possibly know anything at all. It is just here that Religion faces a situation the gravity of which can scarcely be overestimated. The same Science which can converse through the open air across an ocean and a continent tells our educated young men and young women that everything is physical matter; that life and force and intelligence are but the by-products of this physical matter; and that individual existence ends at death. Against these assertions Religion, which can give no sign and perform no miracle, must rest its case upon intuition and exhort to faith. The men and women who are

now about to assume charge of the world's progressive activities are in danger of believing that every assertion of Science is true, because it is able to prove so many of its assertions.

The intuitions of our young men and young women are not waning. Quite to the contrary, our intuitions keep pace with the onward strides of evolutionary human development, and we are all the more ready to accept spiritual teachings which corroborate them. But this is an age of analytical reasoning, and we are prone, though reluctantly, to examine our intuitions in the cold light furnished by Science; and if that light be blurred and stigmatic, our intuitions may appear to be merely the ghosts of dead superstitions and vanished traditions.

THE CONFLICT

Just here is the field upon which Religion must battle for its very life; and be it known, frankly and in all calm candour, that the bayonets of the enemy are at its heart. Here is the foundation from which rises the superstructure of unrest, uncertainty, lax morals and world-weariness which manifest themselves everywhere. Here is the soil in which is rooted the bitter-apple-tree of Doubt, flowering with sensuality and greed of the things of to-day, and fructifying with personal vice and public unrighteousness.

What are you going to do about it, you men who have been specially trained for the service of

Religion? You men of Science who realize that your fellows have juggled facts and dogmas; what say you? And you sturdy young men and young women whose mothers coached your infant lips to pray and soothed your childish cares with sacred songs of faith and hope and love; where, seems it to you, lies the path of duty?

THE STRENGTH OF TRUTH

We are prone to take some measure of assurance from the supposition that truth must prevail merely because it is truth, and to rely upon our intuitions and religious teachings as embodying the truth. But we cannot ignore the fact that God works in the affairs of men through human agencies, and that Truth is no stronger in battle than the arm which wields its sword. Truth never has been, and never can be, destroyed; but great civilizations have crumbled and great institutions have failed because the truths upon which they were founded were not properly defended against their enemies. While truth cannot be destroyed, it can be put out of the counsels of men, institutions and nations, leaving them to the avenging sword of Retributive Justice. History bears eloquent witness to all of these things. The ancient civilizations of Egypt, Babylon and Rome were founded upon the great moral principles of Equity, Justice and Right, and the men and women who gave them their glory and power recognized and were guided by the great precepts which have been

fundamental in all religious systems worthy of note. Their decay set in only when later generations departed from these principles, and substituted materialistic error for moral truth. Great wealth engendered selfishness and greed, and large knowledge of physical things obscured the spiritual vision. Then came degeneracy, devolution and decay. Religion is now confronted with the task of battling against these same tendencies in modern civilization. It cannot destroy true scientific discoveries; it cannot even ignore them. Its task is rather to classify and coördinate such discoveries, making them a part of its larger system. The future of our present civilization depends upon the manner in which it shall perform this task. If general education and dissemination of knowledge means an ever increasing belief that there is nothing in the universe but physical matter and its phenomena, then our present civilization, like its predecessors, is headed for destruction.

THE CHALLENGE

The gravity of the situation is thus freely conceded. The crisis is thus frankly admitted. Nevertheless, the following pages are to be a challenge to "Materialism" in all its forms. It is proposed to demonstrate that Science has not made a single discovery which even tends to refute the fundamental conceptions of Religion. The purpose is to go even further, and demonstrate that many scientific discoveries strongly corroborate religious beliefs and

intuitions. In these attempted demonstrations there will be no reliance upon any sacred writing or religious creed. The battle will be offered in the enemy's country, and the weapons will be those which Science itself has chosen. Such references as shall be made to religious teachings and sacred writings will be made merely for the purpose of showing that scientific discovery corroborates them, and not for the purpose of using them as evidence.

GLOSSARY

And since we are about to invade the enemy's country, it is necessary that we know a little something about the language spoken there. In other words, this is to be largely a controversy with Science, and in order to conduct it intelligently and rationally we ought to know the meaning of a few of the most important scientific terms that must be employed. Therefore, this first chapter will be concluded with a brief glossary of such of those terms as seem pertinent.

Electron. The smallest particle into which man has been able to divide matter. An electron is generally supposed to be a very small particle of electricity, and it is also generally supposed that a number of them revolving around another small particle of something called a nucleus compose the next larger particle of matter called an atom.

All forms of matter, regardless of how firm and solid they may seem, are built up of these very small particles called atoms. They are so very

small that they cannot be seen, even with the aid of the most powerful microscope.

Molecule. A particle of matter next larger than the atom, and being merely a grouping of two or more atoms. Water is composed of molecules built up of oxygen atoms and hydrogen atoms. Sand and the various kinds of flint are composed of molecules built up of oxygen atoms and silicon atoms. And so it is with all material substances; they are all mere aggregations of molecules built up of various kinds of atoms.

Ion. A fractional part of a molecule. In chemical changes and modifications, and especially in those changes and modifications that are aided by electricity, the molecules are sometimes broken up into smaller groups of atoms called ions. The ions still contain two or more atoms, but there are not enough of them to constitute a molecule.

Crystals. The hard, irregular bodies of which the entities of the mineral kingdom are built up. Crystals are merely large groups of molecules so arranged as to manifest straight lines and abrupt angles. All of the solid entities of the mineral kingdom are built up of crystals. They occur in many different forms and sizes. Some are so large that we can see them and handle them, and some are so small that they can be seen only by the use of a powerful microscope.

Cells. The small plastic entities of which the vegetable and animal kingdoms are built up. Cells assume many different shapes under different con-

ditions, but they never take the rough irregular form of crystals. While they are in process of growth and multiplication they are always soft, but they often become hard and rigid in their later stages, as in the bones and hoofs of animals, in hard wood, and so forth. Some cells can be seen by the unaided eye, but the great majority of them are so small that they can only be seen by the aid of a microscope. Cells, like crystals, are composed of molecules which in turn are composed of atoms, the difference being only in form.

Ether. A substance very much finer than air which seems to be everywhere, and which passes freely through all known forms of matter. The light and heat which come to us from the sun are merely waves in the ether, and the same is true of all kinds of light and radiant heat. The atmosphere ends a few hundred miles above the surface of the earth, but the ether continues for hundreds of millions of miles to the remotest star, and beyond. So far as we are able to judge, its presence is without limit. There is also a drug called ether, to which reference may be made later, and with which the all-pervading ether should not be confounded.

Homogenous. Perfectly solid and without particles. All known forms of matter are composed of particles, but the ether is supposed to be homogenous.

Wave-Length. The length of any particular wave moving through a medium. If a stone be dropped into a placid lake, waves will move away

in all directions, and will have definite lengths. If a piece of metal submerged in water be struck with a hammer, waves of a particular length will radiate from the point of contact in all directions, and if a suitable diaphragm be lowered into the water at a distance these waves will impinge upon it and reproduce the sound of the stroke. Likewise, various sounds proceed through the air in various wave-lengths, according to the nature of the sound. If these air-waves move in regular trains, all of the same length, and with all of their undulations the same distance apart, the sound will have tone. But if the waves go forth in irregular pulses, the sound will be merely noise.

Amplitude. The "height" of a wave. The middle C string of a piano always gives off the same lengths of waves into the surrounding air, regardless of whether it be struck gently or with considerable force; but if it be struck with considerable force, the amplitude of the waves will be greater—that is, they will have a wider range of undulatory motion—and the sound will be louder. The waves in the ether which we know as "heat" are likewise always of the same length, whether the heat be merely a warm glow or the blast of a furnace. Intense heat is produced by greater amplitudes of the heat-waves. Science is rather inclined to the opinion that the heat given off by very hot bodies, such as our sun, contain heat-waves which are shorter than the waves of ordinary heat, but if this be true, it means merely that

there are forms of heat with which we are not ordinarily familiar.

Polarity. That principle of magnetic bodies which causes them to attract or repel each other. We have all seen horseshoe magnets, and many of us have seen bar magnets. There is really no difference between these two kinds of magnets except their shape. One end of the piece of metal is a "positive pole," and the other end is a "negative pole," regardless of the shape. If the positive pole of one magnet be brought near the negative pole of another, they will be mutually attracted; but if similar poles of two magnets be brought into close proximity, they will be mutually repelled. It will be said, in subsequent chapters, that certain kinds of bodies are of "opposite polarity." In order that our scientific friends who have specialized in the realm of magnetism and electricity may not lay the book aside in disgust as soon as they see this statement concerning "opposite polarity," it is necessary to explain to them in advance just what is meant by it.

Scientists know, of course, that, literally and technically speaking, two entities cannot be of opposite polarity; because every magnetic body, be it large or small, has two opposite poles, so that the polarity of every magnetic body is alike. This is not disputed. But when it is stated of two kinds of atoms, for instance, that they are of opposite polarity, the statement means merely that one of the atoms is actively and aggressively magnetic,

and that the other is passively magnetic. When the actively magnetic atom presents one of its poles to the atom which is passively magnetic, the latter also becomes actively magnetic by induction in such a way that it presents an opposite pole and thereby sets up a mutual attraction. If the actively magnetic atom presents its positive pole to an atom which is passively magnetic, the passively magnetic atom at once becomes actively magnetic by induction and presents its negative pole to the positive pole of the other. A steel magnet is a fair example of active magnetism, and a bar of soft iron is a fair example of passive magnetism.

But all magnetic substances do not act in the manner here described. If a piece of bismuth, for instance, be brought into close proximity to an actively magnetic substance, such as a magnet, the bismuth will become actively magnetic by induction, but it will present a pole similar to the one presented to it, thereby resulting in repulsion instead of attraction. There are many other mineral substances which act in the same way as the bismuth, and they are said to be "diamagnetic." This treatise cannot very well be repeated every time it becomes necessary to refer to these characteristics; but whenever it shall hereafter be said that two bodies are of opposite polarity, that statement will be intended to mean that one is actively magnetic, and that the other is passively magnetic in such a fashion that if it be brought into proximity to an actively magnetic body it will become

actively magnetic by induction, and will present a pole opposite to the one presented to it, thereby resulting in mutual attraction. And whenever it shall be said that two bodies are of similar polarity, that statement will mean that one of the bodies is actively magnetic, and that the other is diamagnetic.

These definitions and explanations of scientific terms may seem to the reader to be going far away from a consideration of religious teachings. But we are here seeking to know something about God and Immortality, and the search will be futile unless we know something of the principles, potencies, properties and powers through which God is expressed and upon which Immortality is based.

If the reader is of that nondescript type of intelligence which is willing to have some one else do its studying and thinking, he might as well lay this book aside here and now. It is not intended for him. It is addressed to those red-blooded, clear-thinking men and women who are anxious to know and willing to learn the great truths upon which religious beliefs rest. Such as these are earnestly invited to proceed with the author through a consideration of the force through which the all-creative God expresses Himself, and of the matter upon which that force acts.

II

MATTER, LIFE AND INTELLIGENCE

WHENEVER a scientist undertakes to demonstrate, as scientists sometimes do, that the phenomena of life and intelligence are all but so many complex properties of physical matter, he soon brings into action an array of established and assumed facts which he himself must admit baffles the profoundest intelligence of the age. He makes no attempt to solve many of the riddles, and much of the material at hand is left in a state of bewildering chaos. Piecing together such data as he thinks he can understand, he is able to prove conclusively that physical matter is not soul nor spirit. Having followed physical matter into the realm of ultra-microscopy, and having discovered that in its last estate it is composed of very small particles which he calls "atoms," he concludes that it and its phenomena have a monopoly of the entire field. He finds that a certain combination of the atoms called "oxygen" and "hydrogen" and "carbon" result in sugar; that certain other combinations of the same atoms produce starch; while yet other combinations of the same atoms produce fat, alcohol and ether. Why the same kinds of atoms combine in these different forms, and why, having so combined,

they produce substances possessing such widely differing properties, he has not the slightest idea. He finds that our physical bodies are composed of a few very common substances, and that so long as those substances are replenished by food we live and think. He concludes, therefore, that the human body is merely a machine which consumes food as raw material and turns out motion and life and hate and love. Absurdly simple, isn't it? Just mix together a little carbon, oxygen, nitrogen, hydrogen, sulphur, phosphorus and iron; and, presto! you obtain life, intelligence, reason and love. Disturb the equilibrium of the compound, and all these magical qualities disappear, leaving the few simple ingredients to disintegrate. Injure the brain, and consciousness is flicked out as a candle in a gust of wind; and when consciousness returns there is no memory of what transpired during the lapse. Hence, all is physical matter, and nothing more: else why should not the soul or spirit remember what was transpiring while its brain was out of order? "Answer me that, if you can!" he challenges.

And yet there are a few minor things which are very annoying to the "materialistic" scientist. When he gets down to the atoms of which all physical matter is composed, he finds that those atoms are constantly vibrating with wonderful rapidity, and from no apparent cause. He is very sure that he has reached the end of all matter, and that there is no force except such as matter generates; and so

he solemnly contemplates this wonderful vibratory motion of the atoms for a while, and then comes to the conclusion that they are "self-moved." He also finds that a certain mineral salt always manifests as a crystal having six sides, while another salt manifests as a crystal having eight sides, and so on through the whole range of crystallization; but he can discover no reason for this variation, nor even for crystallization in any form. Then, too, he finds that certain groupings of chemical substances known as "seeds" have a habit of growing into plants and trees of the same kind as those on which they grew, while his exact chemical duplicate of the seed refuses to grow. He is fully convinced that all the phenomena of germination and growth are but properties of the physical matter of which the seed is composed, and cannot understand why the cause produced in his laboratory should not produce the same effects as the same cause produced by the plant.

All these perplexities, and a few thousand others, are encountered by the scientist when he undertakes to prove that there is nothing in the universe except physical matter and its properties. He can demonstrate, as has already been conceded, that physical matter is not spiritual matter, nor soul, nor anything else than just physical matter. If that is first blood in the combat, place the score to his credit. But demonstrating that physical matter is not soul nor spirit falls something short of demonstrating that there is no such thing as soul or spirit, as may

more fully appear when we delve deeper into the subject.

THE OLD, OLD QUESTION

The vitality of this discussion lies in the fact that it deals, ultimately, with the destiny of man as an individual intelligence. Religion is a world-wide and age-old characteristic of humanity, and belief in individual existence after death is the master-tone of all religious teachings. The book of Job is the oldest in the Bible, and probably one of the oldest literary productions in the world; and from that remote past comes the troubled query: "If a man die, shall he live again?" This same question, in different forms, has been anxiously repeated again and again as the ages have rolled away, and is still the most vitally interesting question in the world. All forms of religion propound the doctrine of some kind of existence beyond the event of physical death, and they all address themselves very largely to the problem of teaching men and women how to so regulate their conduct while in the physical body that their future existence may be a happy one. The desire for life and happiness is the predominant desire of humanity, and the fact that Religion promises these things in greater abundance is the secret of its wide-spread prevalence.

The uncertainty of life, and doubt as to the issues of death, are responsible for the major portion of earth's wrongs and suffering. Consciousness of the constant approach of death, accompanied by doubt

and uncertainty as to what, if anything, lies beyond it, enhances the apparent value of time and tempts us to gather the most of pleasure and profit from the present, thus fostering feverish haste, worry, greed, and lack of consideration for the rights and prerogatives of others. The sombre shadow of Death falls athwart life's every pleasing prospect, and its skeleton hand adds a drop of gall to every cup of pleasure. All this would be wonderfully and gloriously changed if we could only know that physical death is merely the beginning of a larger life, in which life our happiness and well-being will depend upon our conduct while in the physical body.

If Science can reach and lay bare the very ultimates of all matter, force and intelligence, then Religion will be either scientifically corroborated or scientifically destroyed. If it can be shown that life and force and intelligence are but phenomena of physical matter, then Religion must be abandoned, and codes of human ethics ought to be materially revised. On the other hand, if it shall be found, when the ultimate of physical matter has been reached, that it is acted upon by some extraneous force, intelligently applied, then Religion will still be pardonable, and may be justified upon other grounds than that it is supported by intuition, faith and sacred writings. To endeavour to show by a review and correlation of facts, and by deductions based upon the facts, that this latter is true, is a part of the task here in hand.

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THINGS WE DO NOT KNOW

But let us agree, before attempting to proceed further, that there are some things which we do not know. In order that dispute may be reduced to the minimum, the list will be short and simple. We do not know when nor how matter came into existence. We do not know when nor how force first began to act upon matter. We do not know when nor whence intelligence came into the universe and set its parts in order. But we do know that matter, force and intelligence are facts of nature, and since we do not know their respective beginnings, we must commence our consideration by accepting them as facts.

For many years after Dalton discovered that all physical matter is composed of very small particles called "atoms," it was supposed that these atoms are little round hard things like marbles, which are perfectly homogenous, or solid, and which cannot be broken. This theory never did make a very strong appeal to reason, because men were inclined to believe that little round hard things like marbles, however small, might be smashed into smaller pieces.

This theory of the absolute homogeneity and indivisibility of the atom has now been generally discarded. There is fair scientific evidence that the atom is, in fact, a very complex little thing composed of a central nucleus and many revolving electrons, the arrangement of central nucleus and rotating electrons forming a combination very simi-

lar to a solar system with its sun and revolving planets. There has even been speculation as to whether or not the known positive and negative magnetic qualities of the atoms may depend upon the relative direction in which the electrons revolve around the nucleus, as the direction of the electric current in the winding of an electro-magnet determines the positive and negative poles of its iron core.

Whether the nucleus and electrons of the atom are matter, as we generally understand that term, is a question concerning which there are different and conflicting theories. Some scientists incline to the opinion that these nucleii and electrons are but small eddying currents of force, thereby not only explaining matter, but explaining it away. Others have suggested that atoms are but small whirlpools in the ether which fills all space and pervades all substances. Still others incline to the belief that electricity is itself a very subtle fluid, the positive and negative particles of which group together to form the atom; whence comes the electrical theory of matter of which we have heard much in recent years.

Those scientists who are committed to the theory that the atom is complex in its structure (and among them are some men of international reputation) are strongly inclined to the opinion that, like everything else in nature, it is subject to the refining processes of the general evolutionary scheme.

III

ESTABLISHED FACTS

FROM what has already been said it is evident that the problem of the structural composition of the atom is an unsolved problem. But Science has learned many practical things about atoms which lie far short of their structural composition. Among other things, it knows that some atoms are magnetically positive, and others negative; that some are comparatively heavy, and others comparatively light; that they continuously vibrate with varying rapidity, their vibratory rates being determined, under a given condition, by their weights; and that positive and negative atoms having harmonious vibratory rates combine to form the various elements and compounds which we know as physical matter.

We are here considering things which lie in the realm of the infinitely small. We have reasoned upon the ultimate structure of the atom, briefly referring to one widely entertained theory that it is complex; and yet the smallest particle which could be broken from the point of the finest cambric needle would contain many thousands of atoms. When one makes this comparison with the ordinary conceptions of size and weight, it is quite a mental feat to conceive of one of these atoms as being

itself composed of other particles, "each separated from all others by distances comparatively as great as the distances which separate the planets in a solar system"; this latter being one of the possibilities proposed by those scientists who hold that the atom is complex. The accomplishment of this mental feat is not necessary in the present consideration, but an effort in that direction may be of some help in becoming accustomed to the realm which we are here trying to briefly explore.

COMPRESSIBILITY

Whatever may be our conception of the size and characteristics of the ultimate particles composing matter, Science holds, and we are bound to admit, that those particles are not in contact with each other. All physical matter is compressible; that is, any physical object can be made smaller by pressure. This would not be so if the ultimate particles were in contact with each other. It was long supposed that liquids were not compressible, but it is now well known that they are. Water, for instance, when subjected to a pressure of fifteen pounds to the square inch, loses only five one hundred thousandths of its volume; but if the pressure be increased to fifteen thousand pounds to the square inch, it loses one-twentieth of its volume. That water literally "has holes in it" is positively proved by the fact that a small quantity of pure alcohol may be added to it without increasing its volume. That this compound of water and alcohol

still "has holes in it" is proved by the fact that a small quantity of ether may still be added to it without increasing its volume. In other words, a glass filled with water to the limit of its capacity does not overflow by reason of the addition of alcohol and ether in limited quantities.

"But," says some one, "these facts may not be conclusive proof that the ultimate particles of matter are not in contact; for it may be that those ultimate particles are resilient little bodies, like small rubber balls, in which case their aggregate volume would be reducible under pressure even though they were in actual contact, just as a cubic foot of rubber balls might be made smaller by pressure."

This point is well worth considering, because we cannot afford to ignore any possible factor which might impair the soundness of the deductions to be made in later chapters. It is admitted that if the molecules of water are resilient bodies which may be forced out of their usual form by pressure, regaining that form when the pressure is removed, this fact would account for its compressibility. And it is conceivable that those molecules, being composed of separate atoms, are in fact resilient. But, even admitting that molecules of water may be resilient, how shall we explain the strange blending of alcohol and either with water without increasing its volume? One who is not acquainted with the facts might suggest that the molecules of alcohol and ether may be smaller than the mole-

cules of water, and that they may slip through as shot might slip through a measure of marbles. But are they smaller? Let us see.

A molecule of water is composed of a certain number of oxygen and hydrogen atoms, and a molecule of alcohol or ether is composed of a larger number of oxygen and hydrogen atoms, with some carbon atoms added. Therefore, when the alcohol and ether sink down into the water, larger molecules slip between smaller ones without increasing the aggregate volume, which proves that even in water, one of the least compressible of all substances, the distances which separate the molecules are much greater than their individual diameters—how much greater no one knows. If it be suggested that the atoms composing the molecules may interblend, so that a molecule of water and a molecule of alcohol can each occupy the same space at the same time, then that would prove that the atoms in the molecule are themselves separated by distances greater than their diameters, and we are merely going a little farther afield in order to accomplish the same result. The important fact is that, turn where we may, when our last argument is exhausted we are forced back to the fact that all physical matter is composed of very small particles each separated from all others by distances comparatively great, these distances apparently varying in different substances.

What is true of water is also true of all other substances, be they gases, liquids or solids. Gases

are highly compressible, it being possible, by the use of an ordinary bicycle pump, to force several cubic inches of air into one cubic inch of space.

When we look upon a piece of granite, or a blade of polished steel, it is difficult to realize that it is, in its last analysis, composed of very small particles which are not in contact with each other. But such is undoubtedly the case. Those small particles hold their respective positions by reason of the attractions and counter-attractions of positive and negative magnetic poles and the affinities of harmonic vibratory rates. If the atoms are of a highly magnetic class, and if there is almost perfect harmony between their respective vibratory rates, the resulting substance will be a very hard solid. In such case the particles strongly resist any force which tends to displace them. If the attractions of the particles for each other are too weak to form a rigid solid, or if the harmony between their vibratory rates is imperfect, they form various less rigid substances, ranging from elastic and malleable solids to liquids and gases.

Although Science fully agrees with the findings here made as to the compressibility of matter, we cannot afford to leave this great truth until we have grasped its full significance, and at the risk of seeming tedious it will be again stated. All physical matter is composed of very small particles which are not in contact with each other, and in most cases, if not in all, the distances between them are greater than their individual diameters; all of

which particles are continually vibrating at almost inconceivable rates of speed, these rates being determined by their weights and probably influenced by the tension exerted upon them by the magnetic pull of other atoms around them.

A full mental grasp of this great fact is indispensable to a rational understanding of much which will follow in later chapters. As already pointed out, we are here considering things in the realm of the infinitely small, and unless one is accustomed to think in the terms of that realm, he may not be able to grasp the full significance of those open spaces between the ultimate particles of physical matter. Possibly the point may be more easily conceivable if we can raise it to a realm in which the entities are not so small. If we could use a magnifying-glass which would so magnify the small particles of matter that they would seem to be as large as buckshot, and if we could look through such a glass at a small piece of stone, such as might be used for a paper-weight, we would see a towering boulder larger than the Great Pyramid of Egypt. But instead of appearing to be a solid, rigid mass, it would be a seething swarm of small round particles, each separated from all others by distances greater than their individual diameters, and all vibrating at such enormous rates of speed that the great bulk would manifest to our sense of sight as a kind of hazy mist. This transition from the realm of the ultra-microscopical to a realm with the sizes and distances of which we are acquainted

is a rather long step, but it serves to bring the subject within the range of comprehension without changing the actual conditions.

Considered in this latter aspect, the truth is not so difficult of comprehension. In fact, all true scientific discoveries are comprehensible to average human intelligence when aptly explained. It is only when we attempt to go beyond the actually discovered facts and grope after ultimates that we are baffled and confounded. It may be that man shall some time reach and know the very ultimate of matter. If so, it may be that he shall find that ultimate to be a homogenous mass of ether from which all things else are precipitated, and through which they move without friction; or it may be he shall find that what appears to be solid matter is, in its last estate, nothing but an interplay of forces. The one of these possibilities is about as inconceivable to present human intelligence as the other. So far as we know, either or neither may be true. But we can intelligently pursue the subject as far as the atom of physical matter, as already set forth, and that is entirely sufficient for the present purpose. Only let it be understood that Science has just barely reached the atom of physical matter, and knows nothing of what, if anything, lies beyond it. When it undertakes to say that there is nothing above and beyond the plane or realm of physical matter, it is talking about something of which it is utterly without knowledge.

It may seem that too much time and space have

been devoted to this undisputed fact that the fine particles of physical matter are separated by comparatively great distances; but the importance of it will more fully appear when it is stated that those same distances are the open doors through which Religion may escape from the wall of facts with which Science has endeavoured to impound it. We are here merely recruiting the facts, the marshalling of them being necessarily deferred until the recruiting process has been completed.

IV

FORCE

HAVING briefly reviewed human knowledge of the ultimate of matter, considered apart from the phenomena arising through the operation of force, we will now consider our knowledge of force itself. There is but little to consider, because we know but little.

All our knowledge of this ultimate may be summed up by saying that there is in nature a mobilizing, vitalizing, animating principle which we call force. This principle is co-existent with matter, in either an active or a passive form, but it is not always dependent upon what we usually call matter for its transmission. Light is one manifestation of force, and it passes freely through the most perfect vacuum—a fact of which we have a complete demonstration in the ordinary incandescent light bulb. Light and heat are examples of the active state of force, and cohesion in the stone and molecular strain in the steel spring and the storage battery furnish examples of latent or passive force.

In many instances we can sense the force itself, as well as its effects upon matter ; for one instance, we can feel heat, and we can also see its effects upon matter. In many other instances we are not

sensible of the force itself, but are sensible of its effects upon matter; for one instance here, none of our senses can detect magnetism, and yet it runs our machinery, propels our street-cars, and exerts its power in thousands of other ways equally open to observation. And who will be bold enough to say that there may not be other forces which are not only themselves beyond the limits of our consciousness, but the effects of which also lie beyond the range of our ability to perceive? In this dawning age of wireless communication every animate and inanimate thing upon the face of the earth is almost constantly bombarded by the electro-magnetic waves crackling forth from the thousands of wireless stations, and those waves are constantly working changes in many of the objects upon which they impinge; but unless one be equipped with the proper mechanical apparatus he is insensible alike of the waves and of their accompanying phenomena.

THE AWKWARD POSITION OF SCIENCE

Science has experienced even more difficulties in dealing with the subject of force than it has encountered in the realm of matter. It long since conceived the idea that force is only a phenomenon or property of physical matter, to which idea it is still wedded "for better or for worse." Its fidelity to this idea has led it into some rather awkward places, and has made it say some rather remarkable things. Having traced matter back to its

vibrating atoms, it says: "In the world of molecular physics the molecules and atoms and electrons are self-moved, and are in perpetual motion." Self-moved? So far as our physical senses advise us, yes. In a world teeming with force in a thousand different forms, sensed and unsensed, and in which nothing else moves except through the application of force, electrons and atoms and molecules bobbing up and down of their own accord!

If a man knowing nothing of wireless telegraphy should observe the coherer of a wireless receiving instrument in operation, he would see the iron or nickel filings alternately cohere and fall apart. Upon examination he would find nothing but a wire extending from one end of the little glass tube containing the filings into the air, and another wire extending from the other end into the earth. No mechanism, no magnets, no batteries. Just plain metal filings, "self-moved"! Self-moved? So far as our physical senses advise us, yes. In a world teeming with force in a thousand different forms, sensed and unsensed, and in which nothing else moves except through the application of force, metal filings bobbing up and down of their own accord! But in this instance Science happens to know that the filings are moved by a force playing upon them, so that the "self-moved" theory need not be employed.

If it be true that the vibration of atoms is not produced by extraneous force, it seems passing strange that their vibratory rates should be so

easily influenced by forces with which we are familiar. At freezing temperature the molecular and atomic vibratory rates of water are so modified that it assumes the form of a solid; at 212° F. its molecules widely separate; and if we raise the temperature high enough the vibratory harmony between the atoms of the molecules will be destroyed, thus resolving the water into its constituent gases, oxygen and hydrogen. If we subject air to great pressure at low temperature, its atomic vibratory rates will be so modified that it will become a liquid. These two common materials, air and water, are bland and harmless under ordinary conditions, but if we subject a mixture of them to the intense vibratory heat of an electric arc, their vibratory rates will be so disturbed that they will rearrange themselves into groups forming molecules of nitric acid, a powerful chemical which breaks down all organic matter and many metals. These facts do not fit in very well with the theory that atoms vibrate independently of force; but Science has not yet admitted the possibility of force not generated by physical matter, and is therefore compelled to the conclusion that the atoms are self-moved.

THE IMPORTANCE OF THE PROBLEM

This scientific dictum that the ultimate particles of matter are self-moved may not at first thought seem to be of any great importance; but it is really the parting of the ways for Science and Religion as

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they exist to-day. True Science and true Religion are one and the same thing. No scientific truth can conflict with any religious truth, for the very adequate reason that no one truth can ever conflict with another truth. But the Science of to-day maintains that the phenomena of force, life and intelligence are but so many properties of physical matter; that when the ultimate of physical matter is reached the outposts of the universe are attained, and that the particles of matter there existing are self-moved. The Religion of to-day, on the other hand, maintains broadly, without scientific methods of treatment, and with no rational nomenclature, that the physical realm is vitalized by force not inherent in physical matter, and that at the outposts of that realm begins a realm of finer matter which is intangible to our consciousness because of the comparative coarseness of our physical organs of sense, in which latter realm man continues to exist as an individual intelligence after the event of physical death. The lines are tightly drawn. The issue is squarely presented. Science holds that physical matter is omnipotent and self-moved, and that there is nothing beyond the horizon of the physical world; while Religion contends that physical matter is impotent except as an instrument of expression for extra-physical force, and that at the horizon of the physical world stand the portals of another and finer world. For a long time Intuition was allied with Religion, and Reason was allied with Science; but since we are learning more about the subtle forces

of nature it is not uncommon to find Intuition allied with Science, and Reason fighting the battles of Religion. Many eminent scientists have refused to respect the barriers which their fellows have raised against them, and many progressive religionists have discarded as "non-essentials" some of the purely dogmatic tenets which have been passed along from an unlettered and unscientific age, and which are not supported by either Intuition or Reason.

During the past fifty years Science and Religion have fought many battles on these disputed fields of matter and force, and as a result of those battles there has come into existence the beginnings of a scientific conception and interpretation of Religion which is the basic theme of this book. In other words, there has been an occasional effort to blend together and harmonize some postulate of Science and some cardinal teaching of Religion, and the system of reasoning and deduction thus employed has sometimes been termed "Scientific Faith." Mr. Henry Drummond was an ambitious pioneer in this field, his most notable effort being "The Ascent of Man," a book which attempted to modify "The Descent of Man," Charles Darwin's great book on Evolution. But Mr. Drummond was not always able to distinguish between Mr. Darwin's real discoveries and his speculations and deductions. He accepted as true some of those speculations and deductions which afterwards turned out to be false, and in trying to fit them into a religious system he made

many serious and sometimes ludicrous blunders, which detracted from his otherwise great work and posted a *caveat* against other religionists who might otherwise have been tempted to follow his lead. Latterly, however, the issue has been raised in the ranks of Science itself, and there have been several notable efforts of scientists to show that Religion and Science hold much in common. But such scientists are in the hopeless minority, and their efforts have generally been labelled by the majority as "curious mixtures of scientific fact and theological moonshine."

The battle still centers, as it has centered from the beginning, around the question as to whether or not force is merely a property of physical matter. If Science should ever admit the existence of force acting upon physical matter from without, its inner fortress would be breached, and the hosts of Religion would pour through unopposed. For, once admit the existence of extra-physical force, and the possibility of super-physical matter looms large in the foreground.

If Religion will but take advantage of the present opportunity; if it will but join with those scientists who are willing to assist it in coördinating scientific discoveries and religious beliefs, and in the formulation of a rational nomenclature for the expression of the results thus obtained; it will probably win the battle. Reason and human experience and observation seem to dictate that the present manifestation of physical matter, under

whatever combination of circumstances it may have come into existence, must have come through the agency and operation of some preëxistent force; because all things in the universe the geneses of which we can understand are thus effectuated. So far as we have been able to comprehend the great plan of things, it is founded upon a university of law, and not a diversity; and the theory that sticks and stones and things move only when acted upon by force, while electrons and atoms and molecules are self-actuated, is inconsistent with the idea of a university of law. For atoms and molecules, like stones, are ponderable things having weight and volume, and probably, like stones, move only under the impulse of force. If it be asked: "Whence the force?" we but come again to the ultimate and unknown.

And when at last the battle is won, if it so be that Religion shall win it, Science and Religion will coalesce and go forth to explore new realms, discover new truths, and solve world-old enigmas. One enigma which is pressing for solution, and which some great pioneers in scientific faith believe to be near a solution, is the old, old question of the continuance of individual existence after death. Spiritualism, long overvalued, often honeycombed with fraud, and subject to an infinitely varied assortment of uncertainties, mistakes and inaccuracies, has been taken in hand by Science and is contributing some interesting data. Spiritualism has not yet furnished any conclusive proof

of individual existence after death, but Science, in order to prove that it has not done so, has been compelled to admit some very wonderful things; one of those admissions being that a human mind can instantly transmit its thoughts to another human mind in a remote part of the world, without employing any tangible means of communication. Mediumship has been condemned from the earliest ages, and is undoubtedly immoral and destructive in its effects; but there is now a tendency towards independent development along psychical lines, as contradistinguished from the subjective and dependent methods of mediumship, in the hope and with the expectation that the results thus obtained will be more satisfactory and conclusive. In other words, the effort is to employ the methods of Elisha, instead of those of the medium whom Saul visited at Endor. Just what progress has been made along this new line the general public has not been advised, but there have been some intimations which are calculated to arouse interest, to say the least of it.

Nothing contained in this chapter should be construed as an assertion that force may exist independent of all matter. It may so exist, but we have no knowledge upon this point. All that is here intended is to point out that what we know as physical matter is controlled by force moving through a finer medium.

V

GENESIS

JUST what form the new Science-Religion will take, in case the tendency towards coalition should bear fruit, is a subject very inviting to speculation; and the absorbing interest of the theme ought to be sufficient excuse for an effort to formulate some forethought as to just what trend it may take, and to discover in advance, if possible, some of the high landmarks along the probable way of its investigations and deductions. Henceforward this book will be devoted to such effort. The aim will be to show that the real discoveries of Science and the cardinal beliefs of Religion are harmonious and mutually supplemental; and if this can be done, then the way will be cleared for coalition and coöperation.

At present, Science begins its creed thus: "In the beginning matter . . ." while Religion begins: "In the beginning God. . . ." As has already been indicated, Science will be compelled, if the present advantage is followed up, to substitute something else for that word "matter." What that substitute shall be is of no consequence, but it must be a term which will mean a universal, intelligent force. Since the name is of no importance, and in order that we may rationally discuss the subject,

we will arbitrarily substitute the word "force" for the word "matter" in the beginning of the creed of Science. Only that one small change will we make—only that one stinted concession to Religion. To this slightly revised creed we will add the present knowledge and logical deductions of Science, and then use the resulting formula in grouping the material for a new cosmic conception. With this slightly revised creed before us, we will now proceed to add the pertinent findings and logical deductions of Science, one by one, and thus endeavour to forecast the postulates, deductions and philosophies of the new Science-Religion which may occupy and fructify the realm in which the old Science and the old Religion have been but crude pioneers. To many good people this may seem to foretell an effort to tear down the old landmarks and force them away from things which have been held sacred for generations. Let such good people be reassured. There will be no effort to destroy the Old Time Religion, nor to blast the Rock of Ages. On the other hand, the aim will be to find a reason for the Old Time Religion, and to relieve the Rock of Ages of its overburden of doubt and dogma.

GASEOUS INCANDESCENCE

It is undisputed and indisputable that this earth, by whatever combination of circumstances it may have come into existence, was once hot to the point of gaseous incandescence. Clearly, no form of life

now known to us could have existed under those conditions, and its remoteness from other worlds precludes the possibility that such life might have been transmitted across interplanetary space.

COMPLEX VIBRATORY FORCE

A complex vibratory force, apparently universal in scope, and manifesting as waves in the all-pervading ether, played upon the super-heated mass, tending to cause all atoms of the same weight to vibrate synchronously—that is, at the same speed. This complex vibratory force may be likened unto the atmospheric condition which would result from the simultaneous striking of all the "c" strings of a piano, the longer waves tending to mobilize the heavier atoms, and the shorter waves tending to mobilize the lighter ones. It is just possible that this all-pervading force is as complex in its wavelengths as would be the waves in the atmosphere of a room upon the simultaneous striking of all the strings of a piano the tones of which will harmonize; but that would not affect the principle, and for the sake of simplicity and clarity it will be assumed that each shorter wave is just half as long as the next longer one, which would be the atmospheric condition produced by striking all the "c" strings of a piano. This at once accounts for the vibration of the atoms and for the fact that some of them vibrate more rapidly than others. But the long and voluminous heat waves pulsating through the gaseous mass produced a discord which made vibratory har-

mony between any two atoms impossible, so that there could be no chemical compounds—no solid earth, no water. It is curiously interesting and puzzling to note that the writer of the book of Genesis says that in this stage of creation "the earth was without form, and void."

The proposing of this hypothesis of an all-pervading force again invokes the danger that some of our scientific friends may pronounce the terrible judgment that this book is unscientific. Some of them may say that no ethereal wave-force, however complex, could penetrate to the center of the earth and move the atoms there—that such waves would be refracted, diffracted and absorbed far short of such great penetration. And yet such scientists might be willing to admit the possibility that an atom at the center of the earth is itself nothing but a whorl of force in the ether. They would be bound to admit that certain substances are transparent to certain wave-lengths of force—that is, certain substances, such as air, water and glass, permit the complex ethereal wave-force which we call "light" to pass through them with practically no interference. If the atmosphere could be cleansed of all water-vapour, smoke and dust particles, sunlight could pass through a stratum of it piled up almost to infinity. The same thing might also be said of water, if it could be cleansed of its impurities. Air contains a large percentage of oxygen, and oxygen enters into the composition of water in the proportion of nearly ninety percentum. Glass is largely composed of

silicon and oxygen, and so is the solid earth. Silicon combines with fluorine to form a perfectly transparent gas. We observe, therefore, that the elements of which the solid earth is built up are, in certain states and conditions, perfectly transparent to certain ethereal wave-lengths—that is, they permit those wave-lengths to pass through them with practically no interference. It follows with irresistible logic that in certain other states and conditions those same elements would permit certain other etheral wave-lengths to also pass through them with practically no interference.

MAGNETISM

While we do not know very much about magnetism, we do know that it is a form of force which exerts itself through the most perfect vacuum, thus demonstrating that it moves through a substance not usually classed as matter. All known substances are perfectly transparent to the waves of magnetism, which fact stands stubbornly between man's ingenuity and the achievement of "perpetual motion." If some substance could be found which would absorb (stop) the radiating waves of magnetism, a powerful battery of permanent magnets could be so arranged that they would draw a soft iron armature nearly to their poles, whereupon a sheet of the absorbent substance would be so moved by the motion thus produced that it would drop between the magnets and the armature, thus stopping the attraction. Then, if another battery of permanent magnets should be

set up opposite to the first battery, with another soft iron armature in front of them, and with another sheet of the absorbent substance so placed that it would rise as the other sheet dropped, and if these two soft iron armatures should be connected by a piston; the whole would constitute a magnetic engine which would run until its parts were worn out, with no consumption of fuel and no abatement of its energy. But the substance which will thus interfere with the radiating waves of magnetism refuses to be discovered. If a substance could be found which would even slightly interfere with the magnetic waves, a delicate engine could be constructed which would go, even though it could not be made to produce power in commercial quantities.

X-RAYS AND RADIUM

We find, therefore, that one known form of radiating waves can pass through all substances without interference. Since the discovery of X-rays and radium we have learned that certain other wave-lengths can pass through substances which were once supposed to be "opaque" to all wave-lengths.

We have already learned many strange and intricate things about radiating ethereal wave-lengths, although our knowledge in that interesting realm is still in its early infancy. As to the waves which we have actually detected, there are many collateral and subsidiary things which we do not know, and we must admit in all humility that there may be

very many other waves which we have never detected at all; all of which will be frankly conceded by any scientist who is not afflicted with blinding egotism.

It is hoped that this brief review of some of the known facts concerning ether-waves may induce our swift-judging scientific friends to suspend final sentence for yet a little while.

Heat-waves seem to be discordant to all the other waves which impel atoms to vibrate; because heat disturbs the atomic activity of all known forms of physical matter. If the amplitudes of the heat-waves are low, the atomic disturbance produced by their resulting discord manifests itself to our senses merely as "warmth"; but if the amplitudes be high, the resulting discord manifests itself to our senses as "heat," and causes various compound substances to break up into their component atoms and rearrange themselves.

NATURE'S FORMULA FOR EVOLUTION

As the fiery globe gradually lost its heat through radiation, the light and high-floating hydrogen cooled sufficiently to permit some of its atoms to reach a harmonic vibratory rate with some of the underlying atoms of oxygen, thus effecting earth's first marriages—polygamous unions between one positive oxygen atom and two negative hydrogen atoms. Incidentally, the first compound entities (molecules of water) thus came into being, AND NATURE'S FORMULA FOR EVOLUTION WAS EX-

POUNDED. Two kinds of atoms had responded to shorter waves of vibratory force than any to which they had theretofore responded, and as a result of this response they combined into a new form of matter having an appearance and qualities entirely different from anything which had theretofore existed in the environs of the earth. Gaseous incandescence thus took the first step towards conditions that are known to us to-day.

The molecules of water formed by the union of the oxygen and hydrogen sank into the fiery globe beneath, there to be again disrupted by the intense heat and their component atoms sent forth upon another round of the cycle. And thus the tedious round continued age after age, nature's complex vibratory force establishing harmonic vibratory rates between various kinds of atoms, and uniting positive and negative atoms into compound entities; these entities sinking down into the more intense heat to be disrupted, and their atoms rising again to be reformed, until the entities of the mineral world were at last permanently established and the solid earth appeared.

Even the solid earth was very hot for a long time, so that no water could collect upon its surface, and all the water now in our streams and oceans, and all that percolates through the earth, hung about it in dense clouds of steam and vapour. These clouds poured down great torrents of rain upon the heated earth, and the steam into which this rain was converted helped to dissipate the heat

more rapidly. The planet Jupiter is still in just that stage of evolution, so that when we look at it through a telescope we see nothing but its dense envelope of clouds and vapour.

At last a thin crust on the surface of the earth cooled to a temperature below the boiling point, and water began to gather upon it. Having solidified from a molten mass, the world was a smooth globe, its interior not having yet cooled and shrunken sufficiently to cause its surface to crumple into mountains and valleys and continents and ocean-beds. Hence, there was no dry land. Again we are compelled to note the strikingly curious fact that the writer of the book of Genesis describes this stage of creation by saying: "And God said, Let the waters under the heaven be gathered together in one place, and let the dry land appear: and it was so."

If the atom is indeed complex in its structural composition, and itself subject to evolutionary change and refinement, as many scientists now believe, then this constant grinding, heating and cooling, integration and disintegration, disruption and re-formation, continued through such inconceivable reaches of time, must have resulted in a marked refinement of all atoms and their consequent response to higher vibratory rates playing upon them.

HARMONICS

A brief analysis of this subject of vibratory harmonics will help us the better to understand the

great principle here immediately under consideration. If two pianos be tuned to the same pitch, and then placed on opposite sides of the same room, they may be used to fully and completely demonstrate the selective character of vibrations in their action upon matter in the medium through which they are moving. Of course, the medium of transmission will be air, instead of ether, and the piano strings are infinitely coarser and heavier than atoms, but the principle is the same.

Now, having placed the pianos and opened them, stand near one of them and have some one else strike a key—say middle C—on the other. The middle C string of the piano by which you stand will immediately respond by giving out the same sound, and all the other strings will remain mute. The key of middle C is arbitrarily chosen; the result will be the same whatever key may be employed—that is, the corresponding string on the unused piano will respond, and all others will remain silent. This means merely that the string which is struck is thereby set to vibrating at a certain rate determined by its weight and tension, and that these vibrations send out air-waves of a certain length into the surrounding atmosphere. These waves strike all the strings of the other piano, but they start only one of them to vibrating, and that is the string the weight and tension of which are such that it will respond to a wave of the particular length sent into the air by the string which has been struck. There will be a feeble

response by all the "c" strings above the one which has been struck, owing to shorter waves transmitted by "secondary vibrations" of one-half of it, one-fourth of it, etc., but it is here merely intended to illustrate the principle involved, and not to go into all the technical mathematics of its collateral phases. It sometimes happens that a church window is of such weight and size that it will make vibratory response to one of the deep notes of the pipe-organ, and in many instances the glass has been thus shattered, or jarred from its frame. Other windows in the same church are not affected at all.

Applying these principles to the subject here under consideration, we can understand that a certain ethereal wave-length of the complex vibratory force which we have thrust into the creed of Science would cause a hydrogen atom to vibrate, while another longer wave-length would in like manner affect a heavier oxygen atom; and so on through the whole list of atoms.

There seems to be practically no limit to the capacity of a medium, such as air or ether, to carry different wave-lengths at the same time, provided each shorter wave is just half as long as the next longer one. So long as these respective ratios are maintained, there are shorter waves in longer ones, and ripples in the shorter waves, and shorter ripples in the longer ones, and so on; no one wave interfering with any other. In Music we call this a "harmonic." In Physics and Chemistry, when

we speak of "harmonic vibratory rates" between two atoms, reference is had to the same principle, but here its application is a little more complex, and we mean that the number of vibrations of one of the atoms during a given time is such that if expressed in figures it may be equally divided by some number greater than 1 which will also equally divide the number of vibrations of the other atom during the same time. If the vibratory rate of one atom is such that it may be represented by 3, it sustains a harmonic relation to any other atom the vibratory rate of which may be represented by 6, 9, 12, etc., and does not sustain a harmonic relation to atoms having vibratory rates which may be represented by 4, 5, 7, etc. If two atoms have harmonic vibratory rates, and if they happen also to be of opposite polarity, they will combine into molecules of matter. Groupings of two kinds of such atoms form the various simple compound substances, such as water (composed of oxygen atoms and hydrogen atoms), and sand (composed of oxygen atoms and silicon atoms). Atoms not having natural harmonic vibratory rates are often found in complex compounds containing three or more different kinds of atoms, but in such compounds the two slightly discordant atoms are "tied together" after some fashion by the interposition of a third. It also sometimes happens that discordant atoms thus closely tied together by a third have their natural rates so modified thereby that they will remain united even after the third atom

has been removed. Oxygen and nitrogen furnish an example of this latter kind. These two gases mix together to form air, but the nitrogen merely dilutes the oxygen, just as water dilutes syrup. Their atoms do not group together to form molecules. But in the complex compound known as solid ammonium nitrate the oxygen atoms and the nitrogen atoms are tied together by hydrogen atoms into molecules of the compound. However, if the compound be heated and agitated, some of the oxygen and hydrogen atoms "slip out" to form molecules of water, and the nitrogen atoms and remaining oxygen atoms are yet grouped into molecules which then manifest as nitrous oxide ("laughing-gas") which dentists sometimes use as an anesthetic.

It is just possible that in those complex compounds containing three or more different kinds of atoms two atoms having harmonic vibratory rates first combine to form an ion (fractional molecule), and that the third atom then sustains a harmonic vibratory rate to the ion. We can never know just the relations which the atoms in a complex compound sustain to each other until we know more about the atoms themselves. It may eventually be ascertained that harmony is established between otherwise inharmonious atoms in the complex compound by reason of increased tension produced by the increased magnetic pull caused by bringing so many atoms into one molecule, thereby quickening the rates of some of the atoms upon

which the pull is most powerfully exerted; but any attempt to elucidate such a possibility would be very technical, and could serve no useful purpose here.

It is probable that very few of the different atoms sustain perfect harmonic vibratory relations to each other. That is to say, the exact vibratory relation of 3 and 9 rarely, if ever, exists. The exact relation would probably be more nearly expressed thus: 3 and 9 $\frac{1}{1000}$, or 3 and 8 $\frac{1}{9999}$. If it had been possible for all the atoms to attain a perfect harmonic, they would probably have attained it long ago, and would have thus brought to an end all chemical change, all growth, and all life. Plants and trees grow, and men and animals live and move about, because the atoms of which they are composed are constantly seeking perfect harmonic vibratory relations, just barely failing to attain them, separating in the presence of a little more perfect harmonic for one of them, and recombining with other atoms into other compounds. This constitutes "marriage and divorce in the mineral kingdom," without which chemical change and life and growth would be impossible.

A PURELY MINERAL WORLD

Having paused for the purpose of agreeing upon the exact meaning of some of the terms employed, we will now proceed to a further consideration of the effects of the complex ethereal wave-force upon the mineral world after the dry land had been cast

up from the water by the shrinking of the earth's interior and the consequent "wrinkling" of its hardened surface.

We have already seen that the earth began its career as a mass of white-hot gases. We have now briefly traced the slow and tedious evolution of that gaseous mass into the solid earth, with continents and islands, mountains and valleys, rills and rivers, and lakes and oceans. But our present consideration is still confined to a period when conditions were hostile to any form of physical life. Science still admits, as it has ever admitted, that it cannot explain the beginnings of life upon an isolated world which was at one time in such a condition that life was impossible; but for the purpose of these deductions we are thrusting upon it a factor the existence of which it has heretofore denied. To what it has already demonstrated and convincingly deduced we are adding the dictum of a vibratory force playing upon physical matter from without. We are denying that the atoms are "self-moved," and are asserting that they are impelled to vibrate by the play of a vibratory force, just as the piano string is impelled to vibrate by the play of air vibrations upon it. Beginning with the mass of hot gases, we have discovered the genesis of the first compound entity (a particle of water) and the cause lying immediately back of that genesis. Still further applying this new dictum of a complex vibratory force playing upon the gases from without, we have seen

that while one phase of it caused oxygen and hydrogen to unite to form water, other phases, or wave-lengths, caused other gases to unite into the solids which compose the earth. We have reviewed the drenching of the solid earth with water, its gradual cooling, and finally its assumption of something like its present geographical form.

But we are still contemplating a world millions of miles from all others, and upon which there is no smallest form of life. No fish swims in the tepid waters of any of its seas, nor urchin crawls upon their bottoms. No bird flies through the air, and no animal (not even the smallest microbe) moves upon the earth. There is no tree nor plant anywhere, not even the smallest bit of mould. In short, it is a purely mineral world, made up entirely of solid minerals, liquid minerals, and gaseous minerals. But even as we contemplate it so, we realize that it has evolved far away from gaseous incandescence. The stage is thus set for the great drama of Life; but there are no actors within millions of miles, and those millions of miles span chasms which they cannot cross! And yet to-day the drama is being enacted through the very thickest of its maze of plot and mystery. The actors have come in troupes the numbers of which no man can estimate. Whence? and yet again, How?

VI

EVOLUTION

WE have seen how response of the atoms to the vibratory influence of certain ethereal wave-lengths caused them to combine into the various entities of the mineral kingdom, and we know that the structural characteristic of the solid mineral entities is the crystal. The formation of certain crystals has already been briefly referred to, and we have seen that Science does not know why the crystals of one substance should have eight sides, while those of another have only five or six sides, nor even why matter should assume a crystalline form at all. But it now becomes necessary to go into the matter a little more fully.

All purely mineral solids, whatever their nature or outward manifestation, are built up of crystals of various shapes, colours and sizes, some of them so small that they can be seen only by employing a microscope. These crystals, however small they may be, contain many molecules, and each molecule is composed of numerous atoms. It thus becomes clear, upon a moment's reflection, that vibratory response to certain ethereal wave-lengths of force causes atoms to so group together as to form crystals. Just why response to those certain wave-lengths causes the atoms to so group themselves, we

do not know, any more than we know why it is that snow-crystals retain the general form of irregular discs with six points or spangles through all their various modifications. This is a secret locked in a compartment of Nature's great storehouse of wisdom to which man has not yet found the key. One crude experiment with the operation of this unknown law has been worked out with a drum, a violin, and a little sawdust. The sawdust is sprinkled lightly on the drumhead. Then a deep note of the violin, such as will cause the drumhead to vibrate, is sounded in close proximity to it. The sawdust vibrates in response to the drumhead, and soon begins to gather in groups the general outlines of each of which bear a crude resemblance to all the others. These groups will not break up so long as the same note is sounded; but if the note be changed to another key, they will break up and reform into other groups having general outlines materially different from the outlines of the first groups, but crudely similar to each other.

This experiment is so crude as to be of but little practical value. But crude though it be, it does demonstrate the general principle that when small particles of matter are agitated into rapid vibration they tend to group together in certain forms, and that these forms are determined by the rate of vibration.

VEGETABLE CELLS

While we know that the structural characteristic of the entities of the mineral kingdom is the crystal,

and that the entities of the vegetable kingdom are composed of atoms drawn from the mineral kingdom, we also know that the structural characteristic of the entities of the vegetable kingdom is the plastic cell. The mineral crystal is a hard, irregular body, with straight lines and abrupt angles, while the vegetable cell is usually globular in form, smooth in outline, and plastic in its general nature. And yet the vegetable cell is constructed of the same kinds of atoms as go into the structure of the crystal. Carbon, occurring almost pure in the form of graphite, and as a constituent of a compound in marble and many other mineral substances, assumes the crystalline form. Occurring again almost pure in cotton, and as a constituent of many other organic substances, it assumes the cellular form. And what is here said of carbon may be said with equal truth of all other mineral substances utilized in vegetable growth.

We have already noted that the entities of the mineral kingdom were built up long before there were any vegetable entities, and we now observe that the various atoms assumed the crystalline forms appearing in mineral building because of their vibratory response to the longer waves of the complex force playing upon them. We have also observed that Science is ready to admit that the atoms are in process of evolutionary modification and refinement. We have reasoned that if the atoms are really susceptible of refinement, they must have undergone marked refining changes after their first response to

force and during the inestimable ages through which they struggled against "a hostile environment" for harmonic matings among themselves. We have also sensed and crudely demonstrated a natural law which impels small particles of matter to assume one form of aggregation upon response to a particular vibratory rate, and to assume a different form of aggregation upon response to a different vibratory rate. And now we are confronted with the momentous question: What happened when the atoms at and near the surface of the earth were so modified and refined that they responded to shorter wave-lengths of force than those which caused them to aggregate into mineral crystals?

The answer forces itself upon us with such unerring certainty that we cannot escape it. *They began to aggregate in the form of vegetable cells!*

The transition from simple mineral compound to complex vegetable cell was not accomplished at a single bound. As the atoms of the mineral kingdom were gradually refined and quickened their groupings became more and more complex, the resulting compounds becoming more and more unstable, until at last such mineral *media* appeared that it was but a step to the vegetable cell.

This new entity, the vegetable cell, possessed a characteristic which was also something new in the world. It had a strong affinity for certain mineral atoms, which it absorbed; and, absorbing, grew. Then it "nucleated" and split into two cells, and

these absorbed and grew, and split again. In short, it could reproduce its kind.

A great scientist once said that if he could explain the genesis of a single vegetable cell, he could account for all the life in the world; because he could show how it would be possible for that one cell to develop into all the forms of life, both vegetable and animal, which have appeared upon the earth. But he could not explain the genesis of that one cell. He denied the existence of force acting upon matter from without, and could find no logical reason why dead mineral matter should, of its own inherent potency, become living vegetable matter. We have here reasoned out his "missing link" (the genesis of the vegetable cell), using the findings and deductions of Science, with nothing added except the one dictum of force acting upon matter from without, which added dictum Religion has always proposed, and which many eminent scientists now accept.

If our only interest were in the subject of physical evolution, we might stop here; because the evolutionists have henceforward fully covered all the debatable ground. But be it remembered that one of the primary purposes of this quest is to find some kind of a satisfactory answer to the question, "If a man die, shall he live again?" Therefore, while we are vitally interested in the evolution of the matter of which our physical bodies are composed, the knowledge we seek in that field is only incidental, our principal purpose being to deter-

mine whether or not there is any place in the known realms of nature for other things than the purely physical. If we should find that there is room for other things than physical matter and its phenomena, then the fundamental beliefs of Religion will stand unrefuted, even though they may not be deemed to be corroborated.

VII

THE GREAT PLAN

WE have now deduced the genesis of vegetable life, and have found that it was the next evolutionary step after the formation of the entities of the mineral kingdom. If we can further demonstrate that it was necessarily the next step, our deductions will be considerably strengthened. The writer of the book of Genesis says it was actually the next step, but so long as we are merely striving to show the probability of extra-physical force and the possibility of super-physical matter, we have promised not to rely upon the authority of any sacred writing, and to "carry the fighting into the enemy's country."

TEMPERING HARSH CONDITIONS

When the earth's temperature had dropped to a degree at which vegetable life was possible, its atmosphere was still in such condition that it was not fit for animal respiration. Some carbon probably then existed in precipitate form, but the great mass of it now appearing in our coal and oil fields, and in animal and vegetable entities, was still in a gaseous state and so polluted the lower atmosphere that no animal could have lived in it. Furthermore, no animal can subsist upon the crys-

talline mineral kingdom. One animal may subsist upon another, which in turn subsisted upon yet another, and so on through a long chain; but at the end of the chain there must be a victim which subsisted upon vegetation.

Therefore, it was necessary that vegetable entities should immediately succeed mineral entities, for at least two reasons; first, in order to purify the air of its carbon; and, second, in order to provide food upon which animals could subsist.

No one knows whether vegetation came into the world through the medium of a few cells capable of growth and reproduction, or whether it had its beginning in profusion; but we do know that there was wonderful profusion during the Carboniferous Period, and that the dominant specimens were coarse, immense and grotesque. And here, for the first time, we get a glimpse of Nature's great Evolutionary Plan. The events under consideration begin to assume order and to evince the rudiments of some kind of a purpose.

FURTHER REFINING

Although the atoms must have been considerably refined during the time in which the earth was cooling and solidifying, as already pointed out, thus fitting them for vibratory response to shorter force-waves which caused them to integrate into vegetable forms, they were still too coarse and sluggish for vibratory response to the still shorter force-waves which might impel them to integrate

into higher forms. Therefore a still further and wholesale refining at and near the earth's surface was the next orderly step. This additional refinement was accomplished by means of a great profusion of simple and immense forms of vegetation which gathered up from the earth and pulled down from the air vast quantities of mineral matter, the atoms of which matter it ground in a veritable Mill of Life and tied together into more highly complex molecules than any which had appeared in the mineral kingdom. This grinding process, and this grouping into more complex entities, must have still further refined the atoms and prepared them for vibratory response to yet shorter force-waves.

Knowing, as we do, that all physical bodies attract each other, unless some repellent force interposes, and having found that atoms are peculiarly susceptible to this law of attraction by reason of their mixed positive and negative character; and knowing, furthermore, that if the mass be increased, either by increasing the size of the body or increasing the number of bodies, the attractive pull upon each waxes stronger; it seems not beyond the range of possibility that the increased number of atoms occurring in the more complex molecules which came at the latter end of the purely mineral period, and at the beginning of the vegetable period, might have resulted in a stronger magnetic pull within the molecule, and a correspondingly increased tensile strain upon each individual atom; thereby hastening the vibratory response of the atoms to higher

vibratory rates through an increase in their tension, just as a piano string may be made to respond to higher or shorter vibrations by increasing its tension. But if we attempt to fit such a theory into the known facts concerning the properties of matter, we encounter actions and reactions of which but little is known, and are confronted with apparent contradictions which cannot be reconciled by anything short of a course of long sustained and highly technical reasoning covering all those known and partially known things which Physics elaborately treats under such sub-titles as "Gravitation," "Periodicity," "Elasticity," "Viscosity," "Kenetics," "Radiation," etc. Manifestly, such treatment is both impracticable and undesirable in a work of this kind. Such a theory, while its correctness is possible, and while it is very inviting to speculative reasoning, is not necessary to show the persuasive possibility that matter has evolved from stage to stage, and from form to form, under the mobilizing influence of force-waves acting upon its particles through the medium of the all-pervading ether. Mere refinement of the atoms from age to age accounts for this evolutionary progress, regardless of whether or not their tension increased as they grouped into more complex forms, and average intelligence can easily comprehend the possibility of such refinement.

EVIDENCES OF REFINEMENT

Evidence of the gradual refinement of physical matter is everywhere apparent, to whatever cause

we may see fit to attribute such refinement. Many of the minerals have been refined into compounds, so that they have become available as food for plants and trees, whereas in their pure state they were not available as such food. As instances: nitrogen has been combined into nitrates; phosphorus has been compounded into phosphate; and metallic potassium has blended into potash salts. The earth's geological strata show that vegetation has gradually become more refined, delicate and complex. There were no cauliflowers, nor Easter Lilies, nor strawberries, nor roses, during the Carboniferous period; because there was no mineral matter then sufficiently refined either to produce or sustain them. But the giant ferns and mosses which dominated the vegetation of that period were tempering harsh conditions against the time when the finer forms should be needed.

As the general outlines of the great Plan thus begin to assume form and connective sequence before our amazed contemplation, we are awe-stricken by its immeasurable scope and infinite wisdom. We begin to understand that there was method in the movement of force upon gaseous incandescence, and that each step was apparently taken in pursuance of an intelligent plan. Realizing that there was a plan, we are compelled also to realize that there must have been a purpose, and to wonder what that purpose was.

VIII

THE GENESIS OF ANIMAL LIFE

HAVING accepted the dictum of a complex wave-force pulsating through the all-pervading ether and playing upon the superheated gases of which the earth was once wholly composed, we have brought order out of the chaotic findings of Science concerning the mineral kingdom, and have brought to light the working plans according to which the solid earth was builded. Now, still holding fast to the idea of a university of law, we have found that a little different phase, or wave-length, of the same force which caused the atoms to group into mineral crystals caused those same atoms to group into vegetable cells, thus covering the solid earth with vegetation. But in the period now immediately under consideration there was no animal life, not even the smallest microbe. However, we have had a glimpse of the general outlines of a plan for so controlling the modes of motion of the small particles of matter as to cause them to integrate into ever finer and better forms; and we have observed that this refining process was still at work in the vegetable kingdom. We are thus led to surmise that when the refining process wrought out during the purely vegetable period had reached a certain point, a still finer phase, or wave-length, of

the complex vibratory force found vibratory response in the refined atoms, and so caused them to integrate into even more complex and improved forms of cells. According to all the deductions and findings of Science, this latter is exactly what happened. Science admits all of this, save only the play of force from without. It admits all these stages and transformations, and the working out of all these forms, in the exact order named; but it contends that all these changes and transformations occurred by reason of some potency inherent in physical matter itself, which potency it does not even pretend to understand, much less explain. According to its view, the vibrating atoms and molecules are "self-moved," and in some mysterious and unknown way they have worked out all the different and complex phenomena of integration, life and growth.

ANIMAL CELLS

As the refining process continued in the realm of vegetation, the vegetable forms continued to grow more and more complex in structural composition, and finer in form and texture, until they were capable of being utilized as food by a higher form of life. This refining process, traced to its foundation, rested upon a gradual refinement of the atoms and their grouping into more and more complex vegetable cells. When a certain stage of refinement and complexity had been reached, the same atoms which were once components of incandescent

gas, and which had successively integrated into mineral crystals and vegetable cells, refined and quickened by each new experience, began grouping themselves into animal cells, resulting in the production of entities which not only had the power to absorb and grow, but which could also feel and move about.

COARSE ANIMAL FORMS

We do not know whether the first animal cells were but vegetable cells evolved, or whether they were entirely new aggregations of atoms. Neither do we know whether animal life began with a few cells, or whether it came with immediate profusion; but we do know that in its early stages it was very profuse, and that its dominant specimens were coarse, immense and grotesque. Finer forms were yet to come, and additional refinement of physical matter must needs be first accomplished. Man could not have subsisted upon the vegetation which fed the first mastodon, and a dinosaurus steak would probably have proved a poison, rather than a food. The mammoth, the mastodon and the dinosaurus were quite otherwise than beautiful, according to our present æsthetic standards; but their immense bodies were capable of assimilating vast quantities of coarse physical matter and grinding it through another mill of life, thus preparing it for finer manifestations.

Thus does the great Plan further unfold as we proceed. The mastodon and the dinosaurus are gone;

and gone are the giant ferns and mosses which once enjungled the earth; but at last we are learning the secret of their existence, and that they did not live and die in vain. Hideous and grotesque though they undoubtedly were, they nevertheless filled their little place and served their little turn in the great scheme of things, and were indispensable links in the chain of events which transformed gaseous incandescence into the teeming world of life and intelligence which we know to-day. During the age in which they lived there were no cows, no poodles, no hogs, no canary birds; because physical conditions were still too crude for the production of these higher forms—the environment was too "hostile" for such battle as they could have offered. Possibly these later and finer forms were evolved from progenitors that were contemporaneous with the huge animals here under consideration; but if so, they have evolved very far from them, whether we try to trace such evolution upward in point of size, or downward.

THE LAW OF NATURAL SELECTION

But the refining process continued in the animal kingdom, just as it had continued in the mineral and vegetable kingdoms. In the mineral kingdom the only bond between the positive and negative entities was magnetic attraction, and their unions were barren of offspring. In the vegetable kingdom the rudiments of sex appeared; and thus came

into the world the "Law of Natural Selection" of which the evolutionists make so much, and which resulted in the reproduction of ever finer and more varied forms. In the animal kingdom this principle of sex, faintly foreshadowed in the division of the atoms into positive and negative, and becoming more marked and potent in the vegetable kingdom, reached a much higher development, and the consequent improvement and variation through reproduction was all the more rapid.

And so it was that the forms of animal life gradually increased in refinement and variety. Such forms as were modified to meet changing conditions survived and variegated, and such as failed to keep pace with changing conditions perished. And thus was evolved the *fauna* which we know to-day.

MAN

Finally, when physical matter had been sufficiently refined and quickened, came that superimposition upon the animal kingdom who chooses to call himself Man. He is the best individual expression of the great Plan, being the last in an ever-improving series. He is the result of shorter force-waves than those which integrated all the forms of life below him; that is, those peculiar traits and characteristics which make him Man are the result of response by the atoms of which he is composed to those shorter and more rapid force-waves. He may be merely an involved ape, or he may be a special creation. That he has greatly

improved and variegated through natural selection there can be no doubt. But he is moved by higher forces and impelled by finer impulses than are the rounds of sentient life below him. He can not only feel, and move about, and think; but he can also will, and reason, and choose contrary to his impulses. He is not only conscious of his environment, but is conscious of himself, and reasons upon his individual relation to the universal scheme of things. Tried out in the chemical laboratory, the composition of his body is not notably different from that of animal bodies; considered from the purely physical standpoint, he is merely an aggregation of the same atoms which were once in the fiery cloud-ball, and which have successively integrated into mineral entities, vegetable entities and animal entities, with all of which entities he shares much in common. But we see in him potentialities of which there is no sign of inherence in the physical matter of which those other entities are composed. While he is closely related to the animal, he is animal with something added. He is an animal the particles of whose body have attained to a degree of refinement and complexity enabling them to respond to force-waves which find no response in the particles of which other animal bodies are built up.

HANDMAIDENS OF EVOLUTION

In the realm of humanity the Law of Natural Selection is quickened in its selective evolutionary

impulse by those characteristics found only in that realm. In other words, each finer characteristic which Nature has developed has become its handmaiden, and has lent its potency to more rapid and complex evolution. When the vegetable cell was developed, it did not passively wait for food until the surrounding mineral atoms were fully refined to its own degree: it possessed a refining power and local vibratory radiation of its own, and it exerted this power in refining the partially refined mineral atoms to its own degree, thereby utilizing them as food and producing the phenomena of growth and reproduction. And, similarly, the animal cell, when it came, possessed and used the power of refining vegetable matter to its own degree. The blind and indiscriminate attractions between the positive and negative particles of the mineral kingdom developed into a selective affinity in the vegetable kingdom which was almost as blind and indiscriminate, but the functions and activities of these two kinds of particles were greatly accentuated. In the mineral kingdom harmonic matings were the result of chance meetings. No one atom made any effort to meet another. In the vegetable kingdom the active particles began to seek the passive particles, and the passive particles waited to be sought. The passive acorn- and nut-cells on the oak and hickory, for instance, remained stationary on the twig where they grew, while the active particles of pollen from the tassels of the same trees left their parent stems,

drifted about in the air, or were carried on the legs of insects, and one of them chancing to come into contact with the orifice of a passive cell-duct, it travelled along that cell-duct until it reached and combined with the passive cell itself, thus forming the beginnings of another tree of probable finer qualities than any other which had theretofore appeared.

In the animal kingdom the active and passive character of the two kinds of entities became more marked, and there entered the additional and somewhat discriminate elements of passive desire and active will and choice. The female was still passive and receptive, and the new element of desire which had its genesis in her kind was a desire with some slight range of discrimination—she was generally more susceptible to the wooing of some males of her kind than to that of others. And among the male entities of the animal kingdom active will took the place of the chances incident to fickle wind-currents and capricious insects.

When humanity appeared upon the earth, its two kinds of entities had inherent in them all the elements of attraction for each other which had governed the entities in the realms below them. The female was still passive and receptive. She was still very largely governed by desire, but her range of discriminatory choice was much broader than had been its range in the animal kingdom. The male was still active and aggressive, but those propensities were largely directed and controlled by the power of will and the faculty of reason.

Thus the Law of Natural Selection gathered recruits at each new accomplishment. It gathered force, momentum and scope as it proceeded. And through the coöperation of these recruited forces, and the consequent increase of its scope and power, its products became ever finer until present conditions were attained. Speculation as to whether physical matter may some time respond to yet higher forces, and thus aggregate into still higher forms, would carry us far beyond the field which we are here trying to briefly explore and partially comprehend. The writer of the book of Genesis says that when God had created man and woman "he rested from all his labours," and apparently this is true. So far as the physical world is concerned, the end of the Plan seems to have been thus reached.

LOVE

And what is this force which we have traced from atom to man? We have already conceded that we do not know whence it comes. But upon a moment's reflection we realize that it is a vibratory principle in nature which impels every entity to seek harmonic mating with another similar entity of opposite polarity. We find the first faint manifestation of this great force in the magnetic attractions and vibratory affinities which impel atoms to unite into mineral substances. In the vegetable kingdom we see it manifesting as selection; in the animal kingdom it assumes the form

of lust; and in the human kingdom it is evolved into love.

Darwin concluded that evolution was the result of feeding and breeding and battling against a hostile environment, and nothing more. Drummond set out to refute some of Darwin's conclusions by showing that Love, which he rightfully concluded is the greatest thing in the world, could not be explained under the feeding, breeding and battling theory; but he finally lost his way in a maze of inconsistencies, and concluded that Love came through so much suffering and sacrifice that it might be said it was thrust upon the world at the point of a sword. According to the hypothesis under which we are here proceeding, evolution is the result of coöperation and harmony, and Love is the force behind it. While Darwin concluded that evolution is unmindful of the individual, looking only to improvement of the species, we are forced to the conclusion that it aims at the well-being of the individual, improvement of the species following as a necessary result. Evolution thus seems to be predicated upon something other than feeding and breeding and battling. Viewed in this light, Love cannot be the mere result of suffering and sacrifice, nor can we agree that it was thrust upon the world at the point of a sword: on the contrary, it is indeed the greatest thing in the world, and is the impelling force back of all action, life and intelligence occurring as concomitants of matter.

NATURE'S FINAL PRODUCTS

From the last alembic in Nature's complex laboratory came these two final products—Man and Woman. They are all too often marred in the making, physically, mentally and morally; but the ideal is frequently very nearly approached, and since we are seeking the end of the Plan, we must look to the ideal. As we contemplate the ideal man and the ideal woman, standing before us as the very embodiment of strength and beauty; pulsating with life; self-conscious in the exercise of their wonderful faculties and powers of will and desire, reason and intuition; so unlike in their essential natures, and yet having their destinies so closely bound up together; and when we remember that they are the final products of so many tedious millions of years of refinement and progress, beginning with the atoms in the fiery globe and running through all the changes we have tried to trace: we can but wonder if they are nothing else than aggregations of physical matter which must soon be resolved back into the elements from which they came. Science sentences them to swift and eternal death: Religion can only bid them hope. Is the sentence imposed by Science a legal sentence? Is it supported by the law and the evidence?

IX

WIDE OPEN DOORS

IT was said in a previous chapter, during a discussion of Compressibility, that the known distances intervening between the ultimate particles of all physical matter are so many open doors through which Religion may escape from the wall of facts with which Science has tried to impound it. We now approach those doors.

SUPER-PHYSICAL MATTER

Until now we have devoted our attention to the problem of extra-physical force and its effects upon physical matter, hurriedly tracing its working out of ever finer and higher physical forms. No effort has been made to prove, nor even to deduce, the existence of super-physical matter. The existence of such super-physical matter cannot be either proved or disproved by the present methods and appliances of Science; because, as has already been noted, those methods and appliances have not yet enabled it to reach the end of physical matter. It has just barely attained to knowledge that all physical matter is composed of very small particles called atoms which are not in contact with each other. It does not know of what the atoms are composed: its savants are still bickering over vari-

ous theories touching this point. These same limitations which make it impossible to prove the existence of super-physical matter also make it impossible to prove its non-existence. So there!

The net of experiment which Science has set to catch the atoms of physical matter is of such large mesh that they pass through it; but in passing through they cause the cork-line to bobble, and scientists are thus advised of their passing. If there are smaller atoms than those which compose physical matter, they freely escape without registering any sign of their passing.

We have observed that the ultimate particles of physical matter are, in most instances, if not in all, separated from each other by distances much greater than their individual diameters. We have seen that water, one of the most nearly incompressible substances in the physical realm, is composed of particles which are comparatively far apart.

What, if anything, occupies those spaces between the ultimate particles of physical matter? Science does not know! Do the smaller atoms of a material finer than physical material gambol across those uncharted fields? Science is utterly unable to answer!

We thus come at last to the very end of scientific knowledge concerning matter, and at this point the great majority of our scientific friends will probably bid us farewell. They will return to their culture-media and alembics, their microscopes and spectroscopes, their chemical formulæ

and tables of atomic weights. May all the powers of good attend them in their great work of emancipating humanity from the bondage of ignorance, superstition and disease, and making this physical world a better place for human abode! Nevertheless, they are most cordially invited to remain with us yet a little longer; for, although we have admitted that we cannot prove the existence of super-physical matter by the employment of their methods and implements, we shall still continue to employ their facts and findings and methods of deduction in an attempt to reason out the probable existence of such matter.

HUMAN INTUITION

Be it remembered that human Intuition has always whispered of the existence of a realm of matter finer than the physical, and of life and intelligence in that realm. Wherever men and women have been found, regardless of the marine leagues or the thousands of years which have separated them from other men and women, there has also been found some kind of a belief in individual existence after death; which belief necessarily implies some kind of a duality of matter, one phase of which is finer and more permanent than the other. If it be contended that this belief might have had its origin in a community from which all races and peoples are remotely descended, its world-wide persistence after the development of such widely divergent racial types, and after the

rise of so many totally different languages, is no less marvellous than the idea that it has separately sprung up in each race.

Sometimes this belief in the duality of matter has assumed crude forms ; but the important fact is its wide-spread prevalence, and not its form. Belief in the literal resurrection of the physical body is a comparatively recent addition to belief in individual existence after death, and is merely an effort of expanding reason to harmonize the whisperings of Intuition with the observable facts.

A SCIENTIFIC BOGIE

For a long time Science tried to frighten away this intuitional belief in the duality of matter and the persistence of the finer body by exhibiting that old bogie labelled, " Two bodies cannot occupy the same space at the same time." And even yet that same old scarecrow, with sleeves now frayed and disclosing its wooden arms, with the tuft of hay protruding from beneath its weather-beaten hat, is sometimes pressed into service. How reluctantly do men yield up their dogmas ! And yet, frayed and weather-beaten though the old bogie may be, and though its pitiful sham is so apparent, the label speaks the everlasting and unalterable truth. Everything here depends upon our conception of a body. A bee and a gnat cannot occupy the same space at the same time, and in that sense the label speaks the truth ; but if we consider a swarm of flying bees as a body, and likewise a swarm of flying

gnats, then two bodies can occupy the same space at the same time, for the two swarms can interblend and fly along together; and, moreover, a man with poor vision would be able to see the swarm of bees, but could not see the swarm of gnats.

Is there really such a realm of finer matter, the smaller ultimate particles of which occupy the spaces between the larger ultimate particles of physical matter? We have seen that the existence of such matter is entirely possible. We have also seen that Intuition whispers of such a realm to every normal human being. Literature is replete with legendary tales of such a "fairyland" and the people dwelling there. Religion rests upon belief in such a world, in which it bids men and women to expect a righting of all the unrighted wrongs of earth, and its own peculiar literature, coming from all countries and all ages, abounds with recitals of how men still clothed with mortal flesh have rationally communicated with the living entities who there abide. For long these legends, creeds, beliefs and records, all sanctioned by the finer elements and nobler impulses of humanity, and forming a part of our conception of the fitness of things, have been confounded by the towering wall of physical facts with which an aggressive and conquering Science has surrounded them; but at last the wall is found to be largely a mass of portals through which they pass unopposed, while Science stands agape.

X

"HOW CAN THESE THINGS BE?"

HAVING discovered that the existence of super-physical matter is possible, and having added to that possibility a modicum of inconclusive evidence, we will now adopt the existence of such a realm of matter as "a working hypothesis," and endeavour to correlate it with the known facts.

INTERBLENDING BODIES

Let us again resort to the hypothetical magnifying-glass which caused the stone paper-weight to appear larger than the Great Pyramid, with its vibrating atoms as large as buckshot, each separated from all others by distances comparatively great; and let us turn this glass towards the physical body of a man. We see a giant form towering far above the clouds, with a girth greater than the base of Mount McKinley, its various atoms ranging in size about the same as in the stone, separated by about the same distances, and behaving in about the same manner.

If this great giant should meet another giant constituted in like manner as himself, each could plainly see the bulk of the other and descry the general outlines of his form and features, but neither would be able to see the small particles of

which the other is composed. They might shake hands with a firm and friendly grasp, and exchange comments on crop conditions or the fluctuations of the stock market. Their hands would not blend together, because the atoms composing the one, being of a certain size and vibrating at a certain rate within a limited space, would resist the intrusion of other atoms of the same kind ; and this resistance would constitute the sense of touch.

But if the first giant man, instead of meeting another constituted as himself, should meet a man of the same size, but built up of particles no larger than birdshot, vibrating at a much more rapid rate than the larger particles in the body of the first man, and each separated from all others by such distances that a particle the size of a buckshot could pass between them ; the giant composed of the larger particles could not see the other at all. And if the different sized particles of which their respective bodies were composed should happen to possess such respective magnetic and vibratory qualities that they could interblend and come very close together without actually coming into contact, then the two men could literally walk through each other without the knowledge of the coarser man—possibly without the knowledge of either. If the magnetic attractions and vibratory agitation among the atoms of the coarser man should result in an induced magnetic field within his body which would be attractive to the atoms in the body of the finer man, inducing the two

kinds of atoms to interblend and assume and maintain certain relative positions without contact; and if under these conditions the two men should come into contact with each other; then their bodies would coalesce and remain interblended as long as the induced magnetic field should remain unimpaired.

If the first giant man here under contemplation had grown up from the first nucleated cell in a realm containing both kinds of atoms, blended together in all his food and drink, then he would have been two interblending bodies at all stages of his existence, instead of one. And if the finer body be assumed to be the more permanent of the two, and capable of a separate existence, then the failure of the coarser one to properly function would cause the induced magnetic field to break down, and the two bodies would separate.

The first giant man was merely an ordinary man highly magnified, so as to reveal the conditions existing in his physical body as shown by the exact findings of Science. The second giant man was merely the spiritual body of an ordinary man, composed of finer particles than is the physical body, and intangible to the physical organs of sense. The induced magnetic field in the physical body is a well established fact, commonly designated as "animal magnetism."

WHY ELECTRICITY KILLS

This illustration of the two interblending men is confidently submitted to such of our scientific

friends as have been patient enough to yet remain with us. They may not believe that two bodies do actually so interblend, but they will not be able to bring forward any scientific discovery which even tends to prove that such interblending is not possible. If they can accept the illustration as showing exact conditions, and if they can realize that the life of the physical body is dependent upon the interblending of the spiritual body, they will be able to solve a mystery which has until now refused to be solved: they will be able to explain the cause of death by electrocution. Ever since it was learned that electricity kills, Science has been vainly trying to find out why and how it kills. In the body of an electrocuted man or animal no tissue is disrupted, and no cell is out of place. If man is really constituted in the dual manner just illustrated, it is quite obvious that a powerful current of electricity passing through his physical body would destroy the harmony and constancy of the induced magnetic field which binds the two bodies together, thus causing them to separate and resulting in the death of the physical body. In such case the physical body would be just as sound and perfect as ever, but its vivifying spiritual body would be gone, and with it would go the mind, soul, or consciousness, leaving the physical body to decay and disintegrate. The spiritual body would not be affected, because the electric current is a physical force acting only upon the induced magnetic field within the physical body.

THE DUALTY OF MATTER

Retaining the hypothesis of two kinds of matter interblending, and adding to it our conception of a university of law, we are persuaded that in the finer realm of matter, as in the coarser, there are varying grades, degrees and stages of refinement, and many different kinds of atoms, the material of that realm interblending not only with the physical matter of human bodies, but also, in its coarser forms, aggregating into interblending counterparts of all the entities below the human kingdom. We are also persuaded that in this finer realm of matter there is evolutionary progress and refinement keeping pace with the progress and refinement of physical matter. We thus get a conception of matter in a truly dual state, one state of it comparatively coarse, the other comparatively fine, and both interblending into a constantly evolving whole under the influence of an all-pervading force which is so complex that it has a wave-length suited to every atom and molecule in both realms.

The moving-picture machine has served to bring out with wonderful clarity, and in many variations and shadings, the fact that men and women everywhere already entertain this conception of two interblending bodies, notwithstanding the failure of Religion to explain it in any rational way, and notwithstanding the dictum of Science that two bodies cannot occupy the same space at the same time. One illustration, selected almost at random from many available ones, will be sufficient. In a

motion-picture dramatization of a well-known poem, the principal actor reclines, near the end of the last scene, in an armchair in a quiet room. An angel, through whose filmy form may be seen the tapestry and furniture of the room, enters and beckons to the man reclining in the chair. Thereupon a likewise filmy form of the man slowly arises from the reclining body and goes away with the angel, leaving the body in the chair to collapse and tumble to the floor.

The making of such a picture is a very simple problem in " trick photography." The room and the reclining man are first photographed in a series of " snap-shots " covering several yards of the film. The machine is then reversed, and the portion of the film which has been subjected to these snap-shot exposures is wound back upon the reel, the man in the chair all the while remaining in the same position. Then the machine is again started forward, the " angel " enters and beckons, and the man rises and walks away. Each snap-shot is thereby double-exposed, and the forms of the actors moving around during the time the second exposures are being made produce pictures through which may be seen the pictures of the room and furniture taken at the first exposure. After the " spiritual man " and the " angel " have walked away the machine is stopped and the actor resumes his position in the chair. Then the machine is again started, and the actor collapses and tumbles to the floor. This complete film, when run through the

reproducing machine, makes the picture above described.

We are not so much interested in the *technique* employed in the production of these "ghost pictures," but we are interested in the conception which inspires people to make such pictures in a country preëmpted by a religious system which, while it teaches generally that death does not end individual existence, has not been able to rationally refute the dogma of Science that two bodies cannot occupy the same space at the same time. Such a conception, so generally entertained, and passing unchallenged as a matter of course, is a powerfully persuasive argument that, notwithstanding the refutation of Science and the inability of Religion to explain, men and women nevertheless intuitively know the truth.

If there is indeed such a world of finer matter as has been here hypothesized, of which a spiritual counterpart of the physical body is composed, the two bodies blending together during the life of the physical and separating at its death, we may readily realize that in the realm of spiritual matter the entities there manifesting, while intangible to the coarse physical organs of sense, are very real and very tangible to intelligent individuals having sense organs composed of that finer matter and unclouded by the obscuring veil of physical flesh. Therefore, in that realm we would expect the fragrance of flowers to be as sweet as in the physical realm; we would expect its scenery to be at least

as grand, and its music as enrapturing ; we would expect its friendships to be just as strong, and its hand-clasps to be just as firm and real ; and, what is more, we would expect love to be just as rapturous and entrancingly happy. All this we would expect, and a great deal more, for it is a finer and better world than the physical, particularly in the realms of its higher manifestations, and free from many of the things which make our mortal hearts sad and hold us back from the attainment of our ideals. In such a realm, largely free from the levelling influences of physical life, the men and women who are vicious, coarse and vulgar would probably find their own place by very reason of their conditions, so that a great " gulf " would indeed be fixed between them and the righteous. If the conception of a university of law and evolution means that these unfortunate men and women will still have an opportunity to better their conditions, then such as hold to the dogma of Eternal Damnation must either reject the conception, or else limit the meaning of the word " eternal " to something less than it is generally understood to mean.

THE SOUL

It has been said in a previous chapter that if the conception of two realms of matter interblending be correct, man is two bodies instead of one. The verb " is " was deliberately chosen, because we were then contemplating man in the sense of his two manifestations. But it is just possible that

the word "is" ought to give place to the word "possesses." Religious literature abounds in the use of the word "soul"; but it is nowhere said that any one has ever seen a soul, super-physical human entities being always referred to as "spirits" or "angels." Modern writers have handled these two words rather carelessly, often using them interchangeably; but the ancient writers evidently did not intend them as synonyms, as a careful reading will abundantly show. And, after all, just what is the ultimate ego—the real "I" which sits somewhere enthroned in every normal human being and exercises dominion over the activities of its material manifestation? Is it physical matter, or a product of physical matter? If there be a spiritual realm, is it matter of that realm, or a product of such matter? If we suppose that it is a third entity, essence or force, which directs and controls the physical body during its interblending with the spiritual body, and which continues to control the spiritual body after its separation from the physical; then we have a perfect answer to the defiant question of Science as to why there is no remembrance of what transpired during a state of injury to the physical brain. Here is the answer: mark it well.

THE DEFIANT QUESTION ANSWERED

If a spiritual counterpart interblends with the physical body, that counterpart must necessarily have eyes and ears and all the other organs and

faculties of sense with which the physical body is endowed, but all composed of such material and keyed to such vibratory pitch that they probably cannot sense the things of the physical realm. Anyway, the average human being has never learned to exercise the organs and faculties of sense belonging to the spiritual body, and the ultimate ego, soul, or mind, can acquire no information through those channels, but must depend upon the sense organs and faculties of the physical body. Therefore, if the physical brain be so injured as to cause it to stop registering the sensations which come in to it from the physical organs and faculties of sense, the soul, or mind, would be entirely without means of acquiring information as to what occurred in the meantime. An illustration may accentuate this point. Suppose a certain man possessed only the two senses of sight and hearing, the senses of taste, smell and touch being totally lacking; and suppose that such a man should be securely blindfolded, and that his ears should be so tightly sealed that he could hear nothing at all. Under these conditions opposing armies might battle around him with attendant roar of cannon and rattle of sabres; the finest orchestra in the world might gather about him and play the most enrapturing music; he might be gorged with wormwood and with nectar; the surrounding atmosphere might be alternately charged with the sweetest fragrances and the most disgusting stenches; both of his legs might be amputated at

the hip-joint; the earth might quake, and blinding lightning flashes hurtle across the sky; but upon removal of the bandage from his eyes and the seals from his ears he would remember absolutely nothing of any of these things. Now, kind scientific friends, if we let the aggregate senses of the physical body represent this unfortunate man's ears, and let the aggregate senses of the spiritual body represent his eyes, your supposedly unanswerable question is answered. It is not contemplated that you will say the man lying blindfolded and with stopped ears could still think, and that he would afterwards remember his thoughts; because your psychologists are committed to the dictum that thought is either a correlation of present things, or of present things with those of the past or future, and to a man under the conditions we have supposed there would be no present to which the past or future might be related. He would be in exactly the same condition as a hypnotic subject in a state of profound hypnotic sleep, such sleep being merely the closing up of all the sense channels.

SPIRITUAL ORGANS OF SENSE

Our attention being called to the obvious fact that the spiritual counterpart of the physical body, if there be such counterpart, must be equipped with organs and faculties of sense, we get a step further along the way, and face the interesting question as to whether or not those organs and

faculties of sense may be trained, while still interblending with the physical organs, to sense the things of the spiritual realm. As has already been pointed out, the literature of all religious systems is replete with stories of men and women who rationally and intelligently communicated with spiritual beings, and some of the greatest philosophies and wisest laws in the world are reputed to have come to us in that way.

If we study the characters of the men and women of whom it is thus recorded that they communicated with spiritual beings, we find that they were, without exception, highly moral in their thoughts and conduct, and that they had been thoroughly schooled in self-mastery and self-discipline. They were given to humility and unobtrusiveness, and devoted themselves to study and the unselfish service of their fellow men. Their private lives were pure and wholesome, and their public demeanour was above reproach. We know that the living of such a life produces a condition of the individual which we designate as "refinement," as well as do we know that the living of a selfish and immoral life produces a personal condition which we term "coarse." In other words, we know, when once we come to think of it, that compliance with the active and passive laws of morality produces a condition of refinement and expansion of the individual faculties and capacities ; whilst a violation of those laws results in the coarsening and limitation of the individual faculties and capacities.

We also know that highly refined and intelligent people have the faculty of intuition in a more highly developed state than do the coarse and ignorant; that is, they are better able to "just know" things, and to "get things out of the air."

Can it be that, after all, "intuition" is nothing other than the aggregate of weak and imperfect sensations which reach the soul, or mind, through the almost latent and physically-clouded organs of sense of the spiritual body? And does a life of unselfish morality quicken these perceptions and thin "the veil of the flesh"? And have the prophets and seers of history been men who have lived such lives as to nurse these feeble sensations into clear and rational perceptions, thus enabling them to receive a higher knowledge from the people of a higher plane of life and intelligence? These things are altogether within the range of possibility, and no scientific discovery in any way tends to answer any of these questions in the negative.

THE BASIS OF MORALITY

If the questions propounded in the last preceding paragraph may be answered in the affirmative, then the law and the reason underlying the precepts of morality become immediately apparent. The cardinal "Thou shalt not's" forbid the doing of things which would coarsen our physical and spiritual bodies, paralyze our spiritual senses, and doom us to evil influences and unhappy environments;

whilst the cardinal " Thou shalt's " enjoin upon us the doing of those things which will refine our physical and spiritual bodies, quicken our spiritual senses, and prepare us for abode with the abundantly blessed and happy. According to this conception, the net result of immorality is coarseness and unfitness, and the net result of morality is refinement and fitness. In each instance the effects are registered upon the individual himself, and because of those effects he becomes a certain thing, fitted for a certain place and certain conditions to which he must go because the thing he has become can go to no other. If he lives a life of immorality, he is sinking to a condition of coarseness and unhappiness from which no angel wings can bear him up ; and if he lives a life of morality, he is rising to a condition of light and life and happiness from which no demon claws can drag him down.

XI

OLD GEMS IN NEW SETTINGS

MANY things which have been said in previous chapters seem wonderfully new, and yet strangely old. The reason for this paradoxical seeming lies in the fact that they are but age-old and familiar beliefs and conceptions clad in the nomenclature of modern Science. They are but old friends in new attire. They are old gems in new settings.

OLD TESTAMENT NARRATIVES

The first chapter of the Bible tells the story of the earth's evolution, and of the appearance of the various forms of life, in just the order that we have found these things ought to have come under the refining influence of a complex vibratory force playing upon matter from without. The narrative is short and simple, and devoid of scientific explanations, but the facts are all stated in their proper sequence. As to what, if anything, the writer knew about the intricate workings of the force underlying and producing the phenomena he so briefly describes, we can only speculate. The remarkable thing is that, to the limit he undertook to narrate, he narrated correctly the things which Science has required thousands of years to work out and verify.

If we strip Darwin's evolutionary treatises of their speculations and dogmas, many of which have been proved fallacious, and add the First Cause which he vainly sought, they are but so many enlarged and revised editions of the first chapter of Genesis. Other religious writings than the Bible contain similar narratives, but since this book will probably be confined in its circulation to Christian countries, it is sufficient to merely note this fact in passing; and for the same reason such further references as may be made to the narratives of sacred writings will be limited to the contents of that book.

In the nineteenth chapter of the Bible it is said that super-physical human beings ("angels") visited Lot, a man still clothed upon with mortal flesh, and communed with him; and thenceforward to the closing benediction of Revelation these super-physical beings constantly pass to and fro and freely communicate with such mortals as are prepared to receive their messages. If they were recognized as people who had once possessed physical bodies, that fact was not usually stated, but the two such beings who communicated with Jesus at His Transfiguration were recognized by Peter, James and John as Moses and Elias, both of whom had laid aside their physical bodies several hundred years before that time. To the extent that this narrative of the Transfiguration may be accepted as true, and it is not intended here to either impeach it or vouch for it, it is evidence

that men possess spiritual bodies which may, under proper conditions, be seen and recognized by other men still clothed upon with physical flesh.

In the sixth chapter of Second Kings appears the story of the expedition sent out by the king of Syria to capture the prophet Elisha. The servant of Elisha, seeing that he and his master were surrounded by the Syrians, was in a panic of fear. Elisha was calm, and prayed thus: "Jehovah, I pray thee, open his eyes, that he may see." This young man's physical eyes were probably already very wide open. It is also probable that he was a kind of apprentice to the prophet, and possibly a student in the "School of the Prophets" which had then recently erected a new building in that vicinity. But he had not progressed to the point of being able to see spiritual things. However, under the stress of the circumstances, and with such aid as the prophet could give him through prayer and otherwise, "Jehovah opened the eyes of the young man; and he saw: and, behold, the mountain was full of horses and chariots of fire round about Elisha." That is, according to the working hypothesis we have adopted, his spiritual eyes were opened, and he saw the entities of the spiritual realm, the glorious effulgence of which realm gave those entities such an appearance that to his unaccustomed vision they seemed to be "of fire."

Biblical narratives of communication between super-physical beings and men in the flesh might

be cited by scores and hundreds. Such spiritual beings are usually referred to as "angels," but nothing is said of the wings with which Poetry and Art usually adorn angels, and in their communications with men and women in the flesh they seem to have been very human and very worldly-wise. "Angel" is a good enough name for one of these beings, and another Biblical writer says of the righteous that "their spirits are ministering angels." But in the modern nomenclature of this subject the word "spirit" is usually employed, and conveys to the average man and woman a little clearer idea than does the word "angel."

NEW TESTAMENT NARRATIVES

In the New Testament, which is a collection of the most vital Christian literature, there appear numerous references to the super-physical realm and the conditions there obtaining, culminating in the kaleidoscopic visions and conceptions recorded in Revelation. Paul intimates that he ascended, by some unexplained method, into the "third heaven," though he did not feel at liberty to tell what he saw and heard there. But if he really succeeded in temporarily withdrawing from his physical body, and exploring some of the mysteries of the spiritual realm, that experience may explain how he learned some of the facts with which he strove so mightily in the fifteenth chapter of First Corinthians to make his people understand the very things here and now under consideration.

He was discussing Resurrection, and contemplated that some one would ask what kind of a body a "resurrected" man would have. He employed the terminology and similies of his time in framing his answer, but he made it clear that the body possessed by a human being after death is different in kind and degree from the physical body. A few of his strongest and most forceful expressions will be copied at the beginning of the next succeeding paragraph.

"And that which thou sowest, thou sowest not the body that shall be, but bare grain . . ." "All flesh is not the same flesh, but there is one kind of flesh of men, another flesh of beasts, another of fishes, and another of birds. There are also celestial bodies, and bodies terrestrial: but the glory of the celestial is one, and the glory of the terrestrial is another." "There is a natural body, and there is a spiritual body." The last quoted sentence comes as a climax to the illustrations which immediately precede it, and exactly and in terms states as a fact the most important hypothesis herein adopted. If it be true that each human being has two material bodies, one of which persists indefinitely as a self-conscious individual after the disintegration of the other, that fact is of more vital importance to mankind than all the other facts of nature taken together. Be it again remembered that one of the two chief purposes of this book is to prove, by scientific methods of deduction from facts, the possibility of such dual ex-

istence. Having already demonstrated this possibility, the immediately present purpose is to harmonize it with venerable Christian records and beliefs, lest the author be accused of following after strange gods and propounding seditions. For this prime purpose are these records and beliefs here brought forward, but they are nevertheless circumstances and testimony which cannot be ignored in arriving at the final verdict.

Sporadic beliefs may be erroneous, and the testimony of a few witnesses to the same point may be untrue; but when the same beliefs are indigenous to all lands, and persist through all ages, and when such beliefs are corroborated by the testimony of many witnesses coming from all the far places of the earth in all epochs, and speaking all languages, the burden of proof ought to be upon him who disputes them. Upon evidence far less conclusive we adjudicate the most important property rights and condemn men to death and penal servitude. It is true that living witnesses are not able to give any very positive testimony as to the existence of a spiritual realm and its people; but, as will be more particularly noted further along, the living witnesses come only at certain stages and periods.

And, after all, we would be in a rather poor plight if we knew nothing except what living witnesses could tell us. We would know nothing about King John and the Great Charter; nor about the battles of Waterloo and Bunker Hill. It is only by making records and relying upon them that the

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human race can get ahead. Sometimes the record is false, but error and falsehood are bitter morsels to human Intuition, even when they are mixed with truth, and sooner or later they are found and eliminated.

XII

GOD

DARWIN could not complete his great scheme of Evolution because he could not discover the "First Cause," without which he could not account for his ultimates. Drummond tried to put God into Evolution, but the individual he conjured up possessed so many characteristics repugnant to human ideas of justice and right, and the general fitness of things, that he never attained to any marked degree of popularity.

Several religious systems have proposed a great Man-God, all-wise and all-powerful. One ancient people, feeling that deity ought to combine the aggressive wisdom and active power of masculinity with the gentleness and love of femininity, welded together their father-word "Joh" and their mother-word "Vah," and used the resulting word "Johvah" to express their conception of this duality; and this appellation, carried into Palestine by the early settlers there, was modified into "Jehovah" and used by the Jews to designate their tribal god.

But none of these efforts at personification have been universally satisfactory, it being found, as generations come and go, that the alleged attributes of each of them were strangely tinged with the ideas and aims, traits and characteristics, and

likes and dislikes of the people attempting them. Brahma was caste-bound, Jehovah was jealous, and Allah was cruel.

King David seems to have conceived and expressed the idea of God now generally accepted by Christianity. He said: "If I take the wings of the morning and fly to the uttermost parts of the earth, thou art there; if I ascend to heaven, thou art there; and if I make my bed in hell, lo, thou art there." It is clear that he had in mind some kind of a Presence or Power which is all-embracing and all-pervading. This seems to be the conception of the enlightened people of all religions. Nevertheless, there is something very comforting and intimate in the idea of a great Man-God who stands in the relation of a loving father, ready to heed the cries of his children, and to give them succour and consolation in the hour of their extremity. If man shall ever come to a knowledge of the omnipresent Power, he may then hope to learn whether or not there is within or behind the Power a Personality which fills the place of the loving father, but in the present state of human knowledge speculation in that realm is altogether useless. We are prone to speculate as to what lies behind the things which we must accept as ultimates; but our present duty is to learn more about the laws, hoping that some time we may know the Lawgiver.

The greatness of the subject, and the paucity of human knowledge concerning it, thus invite speculation; but we are here considering the great Uni-

versal Intelligent Force which has effected the earth's evolution from gaseous incandescence unto its present state of teeming life and intelligence.

THE CREATOR

In the earlier stages of the controversy between Science and Religion, the former found much fault with the statement that "God made the world"; because it had become apparent that the world was formed by force acting in or upon matter, and that it could not have been actually constructed by any individual. But we have seen that the earth was evolved through the operation of a complex vibratory force playing upon its ultimate particles from without. We have seen that this complex force produced in the entities of physical matter a peculiar trait which impelled each one of them to seek a harmonious mating with another similar entity of opposite polarity. We found that in the mineral world this trait causes the positive and negative atoms to group into compound entities incapable of further growth. Response to shorter waves of this force caused the atoms to group into more complex entities in the vegetable kingdom, which entities were capable of growth and reproduction. And, tracing the ascending scale of complexity and refinement, we came at last to Man and Woman. When we had reached these two final products, we found that they, too, responded to the great force which impelled the atoms to mate, and that they sought the fulfillment of their highest destiny, and the

attainment of their greatest happiness, in a harmonious mating; the force having manifested a degree in them which is known as "Love." We thus lay bare the amazing fact that the all-pervading, all-embracing Force described by King David wrought out the world and everything in it, and that in the human kingdom it is called "Love." Therefore, Love is God. And "God is Love," just as the New Testament has so tritely informed us all the while.

We have proceeded upon the theory that this all-pervading, all-impelling Force moves in the form of waves through the all-pervading ether. We also know, as a matter of common scientific knowledge, that the ether is capable of being locally agitated into many other wave-lengths, and that certain local waves manifest to our physical eyes as "light." The light of a sun would be comparatively "local," when considered in relation to the immensity of space.

Now, let us suppose that the eyes of a man's spiritual body may be so refined that they can co-ordinate with the all-pervading force-waves which are shorter than the waves which the physical eyes sense as light. The result would be that, for the possessor of such eyes, the whole universe would be ablaze with glorious light, independent of sun, moon or stars. A spiritual body with eyes coarsened and benumbed by immorality would indeed be in outer darkness, notwithstanding this glorious effulgence, for he would be unable to see it.

John the Revelator, in the course of his description of that wonderful city which is to be the abode of the righteous, says: "And the city had no need of the sun, neither of the moon, to shine in it: for the glory of God did lighten it. . . ." Elisha's servant saw such a blaze of light among the mountains round about Dothan that the spiritual horses and chariots moving in it seemed to him to be of fire. A fierce white light, far exceeding the brightness of the noonday, flooded the scene of the Transfiguration. The angel who appeared at the sepulchre of Jesus is alleged to have had "a countenance like lightning." Saul was confronted at the gate of Damascus with a super-physical light which unhorsed him and left him blind.

God is Force; and Force is Light, and Life, and Love. "Blessed are the pure in heart, for they shall see God"; but woe is in store for the wicked and immoral, for they are doomed to darkness.

The end of our reasoning thus brings us to the three great Ultimates—Force, Matter and Intelligence. We are not able even to intelligently speculate as to their beginnings. They are factors in the last equation we can reach.

XIII

THE ECLIPSE

IF force acting upon matter has tended to constantly refine men and women and bring them into closer touch with the spiritual realm, and if the religious records of past ages are worthy to be considered as even circumstances in trying the great issue at bar, why is it that rational communication between the physical and spiritual realms is no longer accomplished ?

There be those who deny that such rational communication between the two realms has ever entirely ceased ; but we will assume that it has, there being no proof which meets the rigid scientific and philosophical tests to which we are here submitting all other evidence.

PERIODICITY

In order to intelligently answer this rather embarrassing question, it is necessary to briefly notice the Law of Periodicity, this law being another ultimate fact of nature which man has never been able to fully understand. Everything in nature occurs in remarkable series of undulations, with accompanying crests and troughs. So moves the surface of the ocean, and so also move the "high" and

"low" atmospheric pressures which produce changing weather conditions. The "high pressures" which the weatherman mentions in his daily reports are merely high waves in the atmosphere, moving from west to east and resulting in clear, cool weather. The "low pressures" are but troughs between the "highs," and bring warm weather and rain. A season of drought is followed by a season of excessive rain. A period of unseasonably warm weather is followed by abnormally low temperatures. "Fat years" and "lean years," in the matter of crop production, alternate with remarkable regularity. Prosperity and business stagnation come alternately, and in spite of all efforts to create a condition of stability. Public unrighteousness runs rife for a while, and then a reform wave "cleans house." Great civilizations rise and flourish for a time, and then men sack their cities, burn their public buildings, and put their fellows to the sword. These are only a few striking examples of the great Law which manifests everywhere.

ANCIENT CIVILIZATIONS

From the high tide of a wonderful civilization which flourished in Egypt long before the Israelites went there, came the web and woof of many of the world's religious teachings, but that civilization collapsed and its sages and seers perished from the earth. Babylon reached a high state of civilization, and produced a religious literature in many

respects strikingly similar to the literature of Judaism and Christianity; but Babylon perished, and with it the "sorcerers" and "soothsayers" who gave it moral strength and spiritual wisdom. Palestine produced a magnificent civilization which built cities, founded colleges, promulgated a code of laws which must always inspire wonder and admiration, and gave the world a store of spiritual wisdom which was so bounteous that we of this present civilization cannot estimate it nor comprehend it. But this great Jewish civilization perished also, with its magnificent capital and its wonderful temple, and its prophets, priests and apostles shared its fate.

Other instances of the rise and fall of great civilizations might be cited to the point of tediousness, some of them in a past so remote that nothing is known of their history, but the few cited instances furnish sufficient illustration for the present purpose. Always at the "peak" of those great civilizations came the illumination of spiritual knowledge and achievement, the records of which have inspired faith, sustained hope, and stimulated morality during the "dark ages" which intervened. In each instance of which we have any record there was first built up a magnificent physical civilization, and then spiritual knowledge and illumination came as the very flower and fruit of it. The great prophets and epoch-makers of Religion came into the midst of great cities full of learning and literature and embellished by art and architecture. They

were often driven forth from those cities, and forced to abide in desert places, but they have not appeared during the periods given over to savagery and barbarism.

PRESENT CIVILIZATION

All this may seem a rather gloomy picture; and so it really is. As we look back upon the ruins of those civilizations which accomplished so much, and promised so much more, we may well pause and soberly ask: "Is our present civilization but another rising crest, beyond which lies a trough of barbarism?" No man knows the answer. But we do know that man is able, through the exercise of will, reason and choice, to adapt himself to nature's laws and make them to conserve and advance his interests. His peculiar faculties, capacities and powers constitute him very largely a law unto himself, and enable him to so direct and apply natural laws and forces in his own being and affairs that they shall make for construction instead of destruction. When we look to the causes of the decay of dead civilizations we find those causes springing up in the lives and inherent natures of men and women. We also know that each succeeding civilization has been better than the one immediately preceding it, especially in the matter of man's ability to understand and apply natural laws and forces. It is also notable that past civilizations have sprung up in isolated places, whereas the present rising civilization is practically world-wide.

In the past, disintegration has had its inception in materialism, greed and immorality within, but the final destruction came at the hands of vandals and barbarians from without. Such *dénouement* is scarcely within the range of possibility at this time, unless it can be conceived that the nations may drop back into barbarism one by one, because of internecine conditions, until finally their hosts will be able to overrun the remaining civilized nations. Whether or not this latter contingency shall happen depends upon the manner in which Religion shall meet the "materialistic" tendencies which have come into the present civilization at an earlier stage than in any preceding one.

These last few words may produce shock, and arouse resentment: because we of this age are prone to think that our civilization is quite mature, and that it has already advanced to a point never attained by any of its predecessors. As to its age, it is quite young. Since the collapse of the contemporaneous Roman, Grecian and Jewish civilizations, there has been such a "falling away," such a lapse into ignorance and semi-barbarism, that we are more familiar with the people and customs of those ancient civilizations than with the people and customs of twelve hundred years ago. Since Plato philosophized, and Cicero orated, and Paul preached, there has been such a lapse into darkness that letters and art and Religion all but perished from the earth.

As to maturity and advancement, it is true that

in point of physical achievement we have made unprecedented progress. Our inventions and our mechanical control of the forces of nature far exceed the similar attainments of any previous civilization. Our attention has been centered upon these things of the physical realm. Our aim has been physical attainment, and here our talents have been spent in sharp rivalries. Our science is physical science. And our philosophy clusters about physical things. If Intuition has whispered of a finer realm of life and intelligence, Reason has stopped its ears and run away to build a steamship, conquer a disease, erect a wireless telegraph station, or draw plans for a tunnel or a canal. This is an age demanding facts, and exercising reason. The danger is that all the facts may not be forthcoming, and that reason will run amuck in the physical realm.

This physical achievement is not to be deprecated. It has paved the way for a grander civilization than the world has ever known. Our inventions and discoveries have bound all peoples together with bonds of common interest and sympathy, and have made the world a vastly better place to live in. The rising wave is broader than any which has preceded it, and the breezes of heaven blow fair upon it. How more glorious ought it to be when at last it shall have attained its highest crest and broken into the rainbow-spray of spiritual light and knowledge!

But our attention has been so centered upon the

physical plane that our higher faculties and perceptions have not kept pace with our physical achievements. Under these conditions we are in danger of concluding that the physical is everything, and that such phenomena as seem to be apart from it must be merely its properties. We are liable to assume the attitude of a man under a hogshead, looking out through a knot-hole and affirming that he sees the whole universe. A realization of this danger inspires the writing of this book.

Our civilization is indeed great, though young. It is very far advanced, but its advancement is along physical lines. It has contributed practically nothing to the world's store of spiritual knowledge. Nature's evolutionary processes are gradually refining men and women towards the point at which they may be able to push aside the veil which separates the physical and spiritual realms, and to thus obtain spiritual information first-hand; but at present all their spiritual knowledge is drawn from a dead past and a vanished civilization, and their faith in its correctness is vivified into a semblance of life only by their insistent intuitions. It will probably require many thousands of years for the rank and file of humanity to reach the ideal, because Nature has all the time there is, and seems to be in no hurry with its work; but our Moseses, and Elishas, and Pauls, and Johns, seem to be about due, and unless the gathering strength of our intuitions and moral standards shall quail be-

fore the frowning heights of scientific "Materialism," we will probably soon begin a spiritual advancement which will be no less marvellous than have been our physical conquests.

All through the last several paragraphs such of our scientific friends as have been good enough to come with us this far have probably been objecting that the question with which this chapter opens is not being answered, and that all these risings and fallings of civilization do not harmonize with the fundamental postulate that all evolutionary advancement is the result of a constant vibratory force, the impulse of which is ever onward and upward. The chapter will be closed with an effort to answer these objections.

IMMORALITY

We have already noted that human refinement depends very largely upon morality, and that immorality coarsens, degrades and destroys. The word "morality," in the sense in which it is here used, includes more than the ordinary definition of that term. It means something more than a mere mechanical doing of certain things, and refraining from others. It includes right living, right action, right thinking, and a right attitude of mind, all wrought out under self-discipline and self-control in the light of our highest knowledge and in response to the noblest promptings of our intuitions. This subject will be treated more fully in a subsequent chapter devoted to it, but it is

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needful that we here somewhat anticipate the subject-matter of that chapter, to the extent, at least, of stating some of the general principles involved.

Man rightly concludes and proudly boasts that he is a "free moral agent." The addition to him of the purely human faculties, capacities and powers makes him such. The constant vibratory force in nature does indeed impel to constant progress onward and upward, and in all the rounds of life below man there is automatic response to this impelling force; but unto man it is given to either coöperate or violate, and the results of his violation are coarsening and retrogression towards the animal plane. Violation becoming nation-wide results in national coarsening and stagnation, and civilizations thus decay.

Just why man has been constituted a free moral agent is another mystery which he has not yet solved; but that he is such, and that by exercising his power of will and faculties of choice and reason he may become largely the master of his own destiny, there is no room for doubt. When Nature had evolved an individual to the estate of man, it gave him certain faculties, capacities and powers which it had not given to any other, and then took him into partnership. Whether he will be faithful to the trust and reap the benefits of the partnership, or whether he will be unfaithful and incur the penalties reserved for defaulters, is a matter which rests with him. The impelling vibratory force still plays upon him, but the very faculties, capacities

and powers which make him man enable him to so coarsen and degrade his individual being that it will no longer respond to the higher phases of that force.

THE WAGES OF SIN

The wages of sin is death, and nations meet their pay-days just as surely as do individuals.

In just what mechanical way immorality works the coarsening and devolution of the individual has been a subject of considerable speculation which has not added much to the world's store of exact knowledge. Still holding to the fundamental hypothesis that all growth, development and refinement are the results of a vibratory force playing upon matter; and accepting the dictum of the scientists that thought is itself a kind of force capable of being transmitted along the nerves to every fibre and cell of the body; it may be reasonably and logically concluded that this thought-force is a vibratory force, and that its intensity and wavelengths may vary with the varying kinds and degrees of thought. In that event, it is not difficult to imagine that such mental conditions as greed, hate, lust, fear, and "guilty conscience," may send through the individual being a local vibratory force which is discordant to the constructive force which comes from without. Nor is it difficult to imagine that such mental states as reverence, purity of thought, forgiveness, kindness, benevolence, love, and "clear conscience," produce local vibratory

forces which harmonize with the force coming from without. If this hypothesis truly accounts for the phenomena produced by morality and immorality, then the individual whose mental states are of the last enumerated kinds is literally "in tune with the Infinite," while the individual whose mental states are of the first enumerated kind is very largely a discordant law unto himself, the local discord in his own being tending to defeat the operation of the general evolutionary force, resulting in a coarsening of both his physical and spiritual bodies, and working a gradual devolution downward from the high estate of man. If these things be true, then it is also literally true that "As a man thinketh in his heart, so is he."

A nation of right-living and right-thinking individuals waxes strong and wise and great; while a nation of wrong-living and wrong-thinking individuals doubles back upon the evolutionary way, and descends to the level which harmonizes with its moral standards. In this descending process the environments which have produced moral degeneracy disappear. The pomp and splendour of wealth are dissipated, and with them vanish the many foibles and temptations which they entail. Ignorance displaces intellectual vanity, greed for a surfeit of physical things gives place to struggle for frugal existence, and the levelling influence of common adversity binds men and women together with natural ties of sympathy, mutual understanding, fraternity and love. And so at last the remnants of the nation

"get back to nature," and begin the task of building all over again.

THE DUTY OF RELIGION

Applying these great laws and principles to present conditions, the duty of Religion becomes immediately apparent, and it also readily appears that the future of present civilization depends upon the manner in which it shall perform that duty. We have already sensed the danger that the present tendency to concentrate upon physical achievement, and to doubt or deny the existence of any reality above and beyond the physical, may, unless promptly and efficiently met, invoke devolution before the rising civilization attains to the spiritual knowledge and illumination which have come at the high crest of previous ones. Such an untimely end is not altogether without precedent: ancient Greece and Rome furnish fair examples. It is true, as has been already stated, that our physical achievements are without precedent, in both rapidity and magnitude, and it may be that the present civilization shall become for all time an example of the folly of trying to build in God-forgetfulness and spiritual darkness.

The exigency cannot be met by a quibbling over creeds among the mentally undersized. The call is for strong men and women, armed to meet a mighty and aggressive foe. There is no lack of such men and women, and if they were furnished with the proper equipment they would gladly volunteer.

But they cannot turn the steel bayonet facts of Science with bare hands and the flimsy armour of Faith and Intuition. Singing "Onward Christian Soldiers" stirs the martial spirit, but the soldiers ought to be armed with modern weapons. Bayonets must be opposed with bayonets. Our churches, colleges and seminaries must meet the challenge of Science by rationally demonstrating that none of its discoveries conflict with the cardinal religious beliefs, but that, on the contrary, many of them are incontrovertibly corroborative of those beliefs. Only arm our educated young men and young women with the actual facts, exposing the palpable shams; give them a rational and intelligent reason for their faith; and they will go forth a mighty conquering host to save civilization from the danger which threatens it, and to bring the world into spiritual light and a knowledge of God. Once let them understand the real truth of the duality of matter and the actual existence of the spiritual realm; teach them the principles of scientific and evolutionary morality, and why immorality coarsens and destroys; and there will arise among them prophets and seers who will lead the nations into the Light.

XIV

LOOKING FORWARD

CIVILIZATIONS which have preceded the present one seem to have made but little use of the forces of nature. They hewed stone, dressed wood, hammered metal, dug canals, and built cities. But practically all of this was accomplished by manual labour. There were a few crude mills turned by water, and possibly here and there a windmill. Petroleum and its products were unknown. There was no knowledge of the power and uses of steam. Explosives were not used, and electricity was undiscovered.

STEAM AND ELECTRICITY

This ignorance of the hidden forces conditioned civilization to small areas, because transportation and communication were difficult and tedious. Our civilization has excelled its predecessors largely through utilization of two things which they did not utilize—steam and electricity. Take away these two great forces, and the things which have grown out of their use, and present civilization would be flattered by comparison with any one of several which long since collapsed.

Let us examine these two great forces, and

ascertain, if we may, just where they belong in a general plan of evolutionary development and growth through the impelling influence of force upon matter. It may be that in the use of these things man has merely learned a little more about manipulating vibratory force; and if this should turn out to be true, it would inspire us to wonder just what may be accomplished when it shall be generally realized that all force, all motion, all growth, all life, and all chemical change, are but so many phenomena of different ethereal wave-lengths. The simple suggestion here made comes like an unexpected blaze of light in the dark, and staggers credulity. Until now our scientific investigations have not been conducted upon any such theory, and, as a consequence, nearly all of our great discoveries have been made by accident.

We have already found that water represents merely a harmonic mating of the atoms of oxygen and hydrogen through the response of those atoms to the longer waves of a force which tends to organize and integrate all the atoms. This mating changed the aggregate form of the atoms from gas to liquid, and greatly reduced their aggregate bulk. We have also seen that the all-pervading ether may be locally agitated into wave-lengths different from those which constantly move through it, and that heat is one form of such agitation. Now, when water is subjected to the action of heat-waves at the amplitude of about 212° F., these waves tend to nullify and defeat the harmonizing influence of

the omnipresent ether-waves, and the component particles of the water incline to resume their gaseous condition. But at ordinary temperatures the disrupting influence of the heat-waves is not strong enough to cause the atoms to entirely fly apart. However, at boiling temperature the next larger entities, composed of groups of atoms and called "molecules," do become very antagonistic to each other, and urgently insist upon moving to comparatively great distances apart. This produces "steam," and the pushing force of the molecules in their efforts to separate is the basis of its power. We all know that this power is used to run great mills and factories, to propel trains about the country, and to push ships across the ocean. In their efforts to move away from each other these molecules sometimes burst a steel boiler, or explode a mountain.

It thus appears that in utilizing the power of steam man merely manipulates the longer and more sluggish of the universal force-waves which first reached coördination with mineral matter.

And what is electricity? We do not know exactly. It may be merely a certain kind of force-waves moving among the atoms and molecules of its various conductors, but some scientists are inclined to believe that it is a very fine bi-atomic form of physical matter, universally existing in a latent state, and which may be set in motion by batteries or generators. This latter idea seriously antagonizes the dogma of Science that there is no

matter above and beyond the ordinary physical matter which we ordinarily perceive, and illustrates one phase of the strange inconsistency into which that dogma is forcing the men who hold that there is nothing beyond the physical.

Whatever electricity may be in its very essence, we know that it is closely related to the mineral kingdom. We also know that it is closely related to mineral magnetism, because each may be readily converted into the other. The electricity generated by blasting-machines, and by the old-fashioned hand-rung telephones, is merely converted magnetism, being produced by agitating magnets: and the magnetism which propels street-cars and turns electric motors is merely converted electricity. While friction between any two or more solid bodies produces more or less electricity (or sets it in motion, if it be a material substance), its production in commercial quantities requires the employment of purely mineral substances—either metallic machines, or batteries composed of metals, carbon, and mineral salts.

It was also demonstrated long ago that electricity, be it force or matter, moves in waves. The length of these waves can be regulated by adjustment of the machine which produces or manipulates the current; and by observing the law of wave-harmony already explained in a previous chapter, and by constructing receiving or registering instruments so that they will respond only to a particular wave-length, several messages may be simultane-

ously transmitted over a single wire without any confusion whatever. Many inter-urban telegraph wires are so used to-day, and in some instances the trunk wires are used for the simultaneous transmission of both telegraphic and telephonic correspondence. If man could but accurately regulate the different wave-lengths generated by his electrical machines, so as to preserve a perfect rhythm among them, there would be no other limit to the number of messages that might be sent than the current carrying capacity of the wire.

OTHER ETHEREAL WAVES

And so it is that everywhere we turn we find the basic governing principle in all phenomena to be vibratory force manifesting in different wave-lengths and through different media. But the main point here under consideration is the apparent fact that, notwithstanding man's wonderful achievements with steam and electricity, we have only learned to manipulate the very coarsest and heaviest phases of nature's great complex vibratory force—the phases, or wave-lengths, which first found response in the sluggishly evolving atoms of the mineral kingdom. What miracles man will be able to conjure up when, if ever, he learns to manipulate the finer phases, or shorter wave-lengths, of the great force which caused the integration of the forms appearing in the vegetable kingdom, we can only speculate.

Some of the efflorescences of electricity give evi-

dence of being very closely akin to the vibratory wave-lengths which produce vegetable cells. By raising the resistance to an electric current very high, thereby putting it under great pressure, it can be forced to "arc" (leap) across an open space of considerable length, and in this leaping process it moves in waves of almost inconceivable rapidity of succession. If after passing through such an open space, or "spark-gap," and having its waves thus enormously shortened and quickened, it be distributed over a network of highly insulated wires strung above a field, so that it must finally dissipate through the air, it will be found that the growth of vegetation on the field will thereby be greatly accelerated and increased. Many market gardens are equipped with just such electric plants, and it is said that the acceleration and increase of growth more than compensate for the cost of installing and operating.

The X-rays are but another form of short and rapid ethereal wave-lengths, produced by forcing a stream of very small particles of matter, under high electrical pressure, to pass through a vacuum and strike a platinum plate. The ethereal wave-lengths produced by the striking of these very small particles against the platinum are very short and very discordant, their discord being due to the fact that the small particles which produce them by striking the plate move in no regular order. In other words, if we could hear X-rays the sound would be merely noise, whereas if we could hear light and heat the

sounds would have tone. These short and discordant rays are invisible to the physical eye, but they possess the uncanny faculty of passing right through the atoms and molecules of which physical matter is composed, and registering upon photographic plates pictures of our skeletons while we are yet alive. The very name of these waves indicate that their exact nature and length are not known, the letter "X" being the usual algebraic symbol of an unknown quantity. But Science knows much more about them now than when the name was first applied to them, and their place in the scale of wave-lengths is supposed to be somewhere in the vicinity of the ultra-violet rays, this latter being a rather loosely used term designating the ether-waves just a little shorter than the shortest light-waves.

It cannot be said at the time of this writing that the wave-length of the X-rays has been definitely ascertained, but what has been here said fairly states the concensus of opinion. There is a dispute at present as to whether or not they are really rays at all, a minority holding that they may be merely streams of fractional atoms. The fact that they affect photographic plates just as light affects them strongly indicates that they are ethereal waves, and each fresh discovery has strengthened this theory and gained converts for it. It will, therefore, be assumed for the immediate present that X-rays are ethereal wave-lengths just a little shorter than the shortest light rays.

We all know the benign uses to which X-rays

have been put in revealing bone fractures and the location of bullets and internal diseased conditions; but we are not all so familiar with some of their other phenomena. It has been found that the X-rays, like the waves dissipated over a field from wires, exercise a powerful influence over vegetable growth; but whether this influence is to be malignant or benign depends upon the intensity of the rays and the length of time in which vegetation is exposed to them. A short exposure to moderate intensity results in accelerated and increased growth, but a long exposure to great intensity results in dwarfing, distortion and death. Exposure of even the germinating seeds of vegetation so modifies the life potentialities bound up in them as to produce similar results in the plants into which they grow. For instance, exposure of germinating beans to moderately intense X-rays for a short time will cause the resulting vines to grow more rapidly and luxuriantly. A little longer exposure to a little greater intensity will also result in a rapid and increased vine growth, but the leaves and stems will be gnarled and distorted. As the intensity and length of exposure are gradually increased from this point, dwarfing sets in, and the gnarling and distortion become more marked, until a duration and intensity are reached which kills the germ outright.

It seems to be thus conclusively demonstrated that ethereal vibratory rates have something to do with the growth and integration of vegetable cells.

It also becomes apparent that the wave-lengths which affect the growth and integration of vegetable cells are shorter and more rapid than the wave-lengths which govern the building up and breaking down of the crystalline entities of the mineral world. We know that heat is merely a series of ethereal wave-lengths a little longer than the longest red ray which the physical eye can sense as light; and we also know of some of the changes which heat-waves produce in the entities of the mineral kingdom. Heat-waves also produce changes in vegetable and animal matter; but such changes are always discordant and destructive changes, accomplished by a breaking down of the natural and constant vibratory rates which build up vegetable and animal cells; whereas the changes they work in mineral matter are often constructive —as, for instances, the formation of carbon dioxide in combustion and of water in the hydrogen flame.

Knowing that heat-waves are comparatively long, and seeing that they often assist in establishing harmony and union among the atoms of the mineral kingdom, we are logically led to the conclusion that the constant and all-pervading ethereal waves which also work out harmony and union among the atoms of the mineral kingdom are likewise long.

The X-rays neither build up nor break down the crystals of the purely mineral kingdom. They begin their constructive and destructive operations only at the point where "life" arises. Since the

X-rays are short, and seeing that they tend to disturb the complex atomic groupings manifesting as vegetable cells, we logically conclude that the all-pervading and constant ethereal waves which result in the aggregation of atoms into vegetable cells are also short; because similar results are logically attributable to similar causes. The fact that the effects of X-rays upon animal cells are very similar to their effects upon vegetable cells indicates the close relationship between these two manifestations of matter.

This theory that short ethereal vibratory impulses have something to do with the integration and growth of vegetable cells is abundantly corroborated by the common knowledge of all men that light, which is but another series of short ethereal vibrations, is so indispensable to plant welfare. But while light is a stimulant to vegetable growth, we do not begin to strike at the very vitals of cellular integration until we reach a still shorter ethereal wave-length in the vicinity of the X-rays. We must, therefore, conclude that the natural and constant ethereal wave-lengths which impel the integration of atoms into vegetable cells are just a little shorter than the shortest light waves.

This latter conclusion forces upon our attention the infinite narrowness of range of the ethereal vibrations which manifest to us as light; for if the conclusion be correct, they are all crowded into a small space in the great scale of wave-lengths in

the vicinity of the shortest electro-magnetic wave of the mineral kingdom and the longest vito-chemical waves of the vegetable kingdom. What other floods of glorious light must lave the universe, were our coarse physical eyes but attuned to register its vibrations! But they are not so attuned. They are like one of the telegraph instruments attached to the wire along which many different wave-lengths of electricity are running; they register those wave-lengths to which they are attuned, and the others make no impression upon them.

HOW VEGETATION GROWS

Light produces some measure of atomic activity and chemical change in many mineral substances, and it is possible that in ages agone, when certain complex mineral compounds had reached a condition of refinement at which they were almost ready to change their vibratory rates from the electro-magnetic to the vito-chemical, it assisted them in making the transition. It apparently performs just that function in vegetable life and growth at the present time. Plants and trees feed upon potash, carbon, phosphorus, nitrogen and water. But if we should fill a pot with a mixture of graphite, phosphorus, metallic potassium and water, set a plant in the mixture, and then place the pot under a bell-jar filled with nitrogen gas, the plant would not grow. All the elements of its food would be present, but they would not be in such states of re-

finement that it could convert them into vegetable cells. But if the potassium be combined with nitrogen or chlorine; if the phosphorus be blended with hydrogen and oxygen into phosphoric acid; if the nitrogen atoms be tied up with sodium and oxygen into sodium nitrate; and if the carbon be compounded with oxygen into carbon dioxide; they will thereby be raised to a condition of refinement which will render them available as food, and the plant will be able to build cells with them; provided, always, that it can have the assistance of light.

A plant totally deprived of light may live for a considerable time, and may absorb water by capillary attraction, and shift some of its constituents around into the form of tender white roots and scions; but the aggregate weight of its solid matter will not be appreciably increased. This point is roughly illustrated by another method sometimes employed by the market-gardener. New potatoes in the winter season are considered a delicacy in northern climates, and the gardener sometimes meets the demand for them in a curious and interesting way. Old potatoes, being comparatively cheap, are thickly embedded in shallow boxes of moist sand in a warm cellar which is utterly dark. The potatoes so conditioned soon began to send out roots into the sand, and to form small new potatoes at the end of some of those roots, but no vines appear. The new potatoes feed upon the parent until it is exhausted, and then their growth ceases. But the old potatoes are converted into new pota-

toes, and the enterprising gardener gets the increased price for his trouble. At one time it was the custom to fill the boxes with moist fertile soil, but it was soon discovered that the new potatoes were produced in proportion to the amount of old potatoes used, without reference to the quality of the soil, and then sand was substituted for the soil for the sake of cleanliness.

This potato experiment shows that potatoes, at least, cannot convert mineral matter into vegetable matter without the vibratory aid of light waves. They can shift their constituent elements around in darkness, but cannot add to them. In short, when the atoms have been refined and grouped into complex molecules to the very limit that these things can be accomplished by the all-pervading ethereal wave-lengths which impel vibration of the atoms of the mineral kingdom, it is still a step (a short one, but nevertheless a step) in the refining and quickening process to the point at which these complex molecules can respond to the next higher all-pervading ethereal wave-lengths which will impel them to aggregate into the form of vegetable cells; and the comparatively local ether-waves which manifest to us as light render their small mede of further refining and quickening at this last step. The atoms thus assisted by light-waves to bridge this last gap and reach coördination with the next higher constant and all-pervading waves are able to remain in coördination with those shorter waves even though the light be afterwards withdrawn.

Being assisted to arrive, they are able to remain, to which phenomenon we find a number of parallels in the mineral kingdom. For instance, oxygen atoms and hydrogen atoms are not quite harmonious in their natural vibratory rates, and will not unite into molecules of water unless they be thereunto initially assisted. Such assistance may be given them by subjecting them to the ether-waves called "heat" at the amplitude of combustion, whereupon they unite to form water, and remain so united even though they afterwards be subjected to temperatures far below freezing.

But the potato experiment in the dark cellar is not the only source of our knowledge concerning the action of light in assisting the plant to "digest" mineral matter and build it into vegetable cells. We know quite a lot besides. We know that in the leaves of all trees and plants there are myriads of little green cells, called "chloroplasts," which, under the stimulation of light, are the busiest workers in the vegetable kingdom. The seed planted in the earth absorbs water, with which it dilutes the dried food stored up within itself; and with this solution it builds white roots which go out into the earth, and a white crown or shoot which goes upward into the air and light. In the process of absorbing water some mineral substances in solution must necessarily, and as a simple matter of mechanics, also be absorbed by the expanding germ, and some chemical rearrangements must

thereby be effected; but none of those mineral substances are converted into purely vegetable matter until the light is reached.

THE MIRACLE PERFORMED

But when the light is reached the crown turns green—some of its cells become chloroplasts. Carbon dioxide (carbonic acid gas, as it is sometimes called) is always present in the atmosphere, being produced by combustion, animal breathing, fermentation, and a number of other causes; and as soon as the sun begins to shine upon the plant it begins to absorb this gas. In other words, when a molecule of carbon dioxide comes into contact with a leaf, it quickly enters through one of the pores and goes to the internal layers, where it blends with water into the form of a molecule of carbonic acid. Then, when the sun shines upon the leaf, the chloroplasts absorb certain of the wave-lengths of light which will cause the atoms in the carbon and water compound to vibrate, and the vibrations thus produced assist those atoms to vibratory response to the constant and all-pervading ether-waves which cause atoms to aggregate into the form of vegetable cells; and the atoms of oxygen, carbon and hydrogen are thus raised from the level of the mineral kingdom and assume the form of vegetable cells, manifesting as various kinds of carbo-hydrates, such as sugar, starch, glucose, gum, etc.

And so it is that we catch dead mineral matter

in the very act of becoming living vegetable matter, and, moreover, we have discovered how it does it.

A technical problem in physics is here encountered, which cannot be totally ignored without inviting the condemnation of our scientific friends, and perhaps causing them to pronounce the entire theory "unscientific." Therefore an effort will be made to state the problem and briefly deal with it in terms which the average layman will be able to understand.

We have already observed that X-rays have something to do with the integration of atoms into vegetable cells, and we have tentatively accepted the majority opinion that those rays are ether-waves which are shorter than light-waves. We have now observed that the chloroplast uses certain light-waves to assist the atoms to respond to the shorter constant and all-pervading ether-waves. Our scientific friends will be prompt in reminding us that the chloroplast absorbs the very longest light-waves, and throws off the shorter ones. This puts our theory into a rather awkward predicament; because it is a considerable distance in the scale of wave-lengths from the red, orange and yellow rays, which the chloroplast freely absorbs, to the place which the X-rays are generally supposed to occupy, and the theory is thus forced into the position of proposing that the longest light-waves and the very short X-rays produce similar vibratory results among the atoms of matter. There seems to be something radically wrong with any such theory.

The problem is thus freely and fairly stated in language which average intelligence can fully understand. It is also freely and frankly admitted that its solution is not simple, and that it can never be complete and satisfactory until we learn something more about what takes place within the chloroplast itself, nor until we know something more definite about the length of the X-rays. The problem presents a number of enigmas, and speculative possibilities arise with each one of them. In the first place, no one knows that X-rays are shorter than the shortest light-waves. The perfect spectrum of sunlight shows numerous dark belts or zones. If sunlight happens to fall on a bevelled mirror lying on a dressing-table near a window, it will be reflected upward to the ceiling in all the colours of the rainbow. These colours are all in the sunlight, and when they are perfectly blended they make white daylight. The bevelled mirror merely causes the different wave-lengths to glance off at different tangents, so that they strike the ceiling at different places. But scientists can make crystal prisms which are geometrically perfect, and which reflect the different rays very much more accurately than does the bevelled mirror. The prismatic colours of light thus reflected are called its spectrum, and it is in this spectrum that the dark zones are found. These dark zones lie between different colours. For instance, the orange colour gradually shades off to a very pure clear yellow, and then there is a clear-cut dark band beyond which the light begins

to assume a greenish tint; which means that in sunlight there are no waves of such length that they may be reflected to this dark zone.

Now, since we can only speculate, and since no one knows the true length of the X-rays, let us suppose that they are of a length which would cause them to fall within this gap between the yellow and the green, such rays being invisible to the physical eye. And let us suppose, further, that the all-pervading and constant wave-lengths which cause mineral matter to become vegetable matter also are of such length that they fall within this gap, taking a place just below the X-rays. If these suppositions can be conceived of as possibly correct, in the light of our present knowledge of the subject, then the perplexing problem is very easily and simply solved. If the wave-lengths are thus properly placed, then it becomes clear that the chloroplast selects such wave-lengths of light as it can use in working the atoms up to the proper pitch, and rejects all others. By playing these selected waves upon the atoms of carbonic acid it raises the vibratory rates of the atoms to a pitch at which they are picked up by the constant and all-pervading ether-waves which cause them to aggregate as sugar, starch, etc. It is also clear that the X-rays, lying just above the all-pervading waves which work this magical change, might exert a powerful influence upon the formation of vegetable cells, though they are just a trifle too short to cause mineral matter to become vegetable matter. This

theory drops the X-rays far down the scale of wave-lengths below the position they are supposed to occupy; but in view of the fact that the scientists know so little about them that they are not even agreed that they are really rays, the liberty thus taken in dealing with them may be pardoned.

In the second place, the chloroplast absorbs small quantities of other rays than the red, orange and yellow, and no one knows just what kind of a vibratory combination it may make, within itself, of large quantities of long rays and small quantities of shorter ones. The possible vibratory effects of a re-combination of these selected rays are too speculative for consideration here. Such a re-combination may result in an improvised ethereal wave which is shorter than any ray of light, and which occupies a place in the scale in the immediate vicinity of the position the X-rays are generally supposed to occupy. If this latter theory be tenable, then it is not necessary to degrade the X-rays from the exalted position in the scale which has been assigned to them.

There is yet another possible explanation of this seeming conflict. The chloroplasts gather at the very surface of the leaf, so as to interpose a shield between the inner layers and the source of light. Mineral matter becomes living vegetable matter in the interior structure of the leaf under the heavy layers of chloroplasts. Now, the layers of chloroplasts stop the red, orange and yellow waves of sunlight, and permit nearly all of the shorter

waves to pass through and penetrate to the almost colourless inner layers of the leaf. A small part of the shorter waves stop in the inner portion of the leaf, though the majority of them pass through. Therefore, it is conceivable that the chloroplasts stop the long waves and convert them into warmth (which is necessary to plant growth), and permit the shorter waves to pass along and play upon the molecules of carbonic acid within the leaf. On account of the extreme scarcity of carbon dioxide in the atmosphere, the leaf never has all the carbonic acid it could manufacture into cells by the use of direct sunlight, which would explain the fact that it uses such a small percentage of the short waves which the chloroplasts allow to pass. The inner layers get all the short waves in the sunlight, but they are short of raw material and can use only a small part of them.

And yet again, the subject will bear speculation from another angle. Let us admit for the moment, and for the sake of argument, that the leaf uses the red and yellow waves of light in performing the miracle of life, and that the absorption of some of the shorter ones is a mere accident. Waves moving through the ether are transverse; that is, they have an up and down motion, as well as a forward motion. Huygen long ago demonstrated that such transverse waves produce in the medium through which they move a veritable network of shorter "secondary waves," which exist for a very short space of time, and are then neu-

tralized and smoothed down by antagonistic interactions among themselves. The principle thus propounded has now been thoroughly worked out and established by other scientists, but it is still known as Huygen's Principle. The secondary waves have a length proportionate to the initial wave which produces them, so that a long initial wave produces comparatively long secondary waves, and a short initial wave produces comparatively short secondary waves. Therefore, even admitting that the leaf uses the long waves of light in giving life to dead mineral matter, it is just possible that the short secondary waves which constantly spring up and die out in these long light-waves are the vibrations that perform the miracle.

This same Huygen's Principle may also offer an explanation of the action of the electro-magnetic waves diffused in the air above growing vegetation. Even the very shortest of these electro-magnetic waves are much longer than any ray of light, but we have seen that they stimulate vegetable growth and cellular aggregation in something of the same fashion that these phenomena are stimulated by the very short X-rays; and it is just possible that the secondary waves within them furnish the motive power so manifested. It is also just possible that the electro-magnetic waves do not actually assist in the transformation of carbonic acid into vegetable cells, but that either they or the shorter secondary waves moving within them

act only upon the purely mineral matter in the plant, thereby merely stimulating sap movement.

Our extreme poverty of exact knowledge concerning this vital question is thus made to fully appear. The hypotheses here proposed as possible solutions are but speculative hypotheses; they may all be incorrect, and the author will be no whit chagrined if they be so accounted and proved. The all-important fact, towering like a mountain peak above all the mists of doubt and speculation, is that some kind of ether-waves cause dead mineral matter to become living vegetable cells. Science will sooner or later learn just what kind of ether-waves produce this wonderful change. It will find and measure the wave-length which the chloroplast employs in bridging the gap between the electro-magnetic wave-lengths of the mineral kingdom and the vito-chemical wave-lengths of the vegetable kingdom, and, having found and measured that wave-length, will produce it artificially.

MORE LEAF CHEMISTRY

Having taken this little excursion into the realm of speculation, let us return to the chloroplast and its work. If starch is the peculiar product of the plant, the chloroplast must always first produce sugar and then convert it into starch, the latter being a more highly complex compound and requiring additional refinement. It requires less sunlight for the production of sugar than for the production of starch. But the chloroplasts in the starch-pro-

ducing plants need not and do not go on a vacation during cloudy weather. When the sky is overcast with clouds they manufacture sugar, which is stored in the leaves, and when the sun shines out brightly they convert this store of sugar into starch.

These carbo-hydrates, whether they be sugar, glucose, starch or gum, go down through the stems or limbs of the plant or tree and become the basis of its food. Combined with the mineral substances which come up from the earth, and which act more as stimulants of sap movement than as food, they make up the sum total of vegetable matter. Incidentally, they are the products which support all animal life, either directly or indirectly, for no animal can subsist upon mineral matter.

SYNTHETIC FOOD

When man shall have learned to artificially produce the ethereal wave-length employed by the little chloroplast, the results which will probably be attained stagger the imagination to even contemplate. One of the inevitable results which looms so large in contemplation as to immediately obtrude itself upon our attention will be the production of artificial food. Water, and carbonic acid gas, and fertile soil or "fertilizer," will be turned into great mills and laboratories, there to be properly blended and treated with the "Chloro-Rays," and will emerge as sugar, starch, glucose, oils, and all such other staple foods as we now derive from vegetation. Droughts and floods and

frosts will then no longer matter. The tillage of the soil, the heaviest unit in the burden of the world's labour, will become a mere pastime of landscape gardening, for even the cattle will be fed with the by-products of the mills. Imagination thus runs mad before even this first and most patent possibility.

When will man work out and apply this great secret? Whenever our scientists come to realize that God is an all-pervading Force acting upon matter from without, and that all life and growth and change are the results of that force alone. But not so long as they are lashed to the cart-tail of the juggernaut "Physical Matter," and go through life acting upon the theory that the physical is everything and that beside it there is nothing else—that all of life, and intelligence, and faith, and hope, and love have a beginning and ending in physical matter. Rebel, noble slaves! Strike off your shackles! You have been looking to physical matter to teach you the secret of life and growth and chemical change, and you have become enmeshed in a tangle of facts and speculations concerning "protoplasm," and "enzymes," and "ferments." Can you not realize that these things did not exist in gaseous incandescence, and that some force must have evolved them from it? You do realize this, in some sort of a way, but you have been trying to find that force in physical matter itself. Look up! Some of your great men have already deserted you. The collaborator of Charles

Darwin lived to acknowledge God as the First Cause behind Evolution, though he never learned much about the operations of that Cause. One of the greatest scientists of this generation is fully committed to the proposition that there is a God-force behind the phenomena of matter, though he has not told us much about how it works. The collaborator of Röentgen is committed to the major hypotheses of this book, and has come marvellously near raising purely mineral matter to the condition of cellular aggregation, if, indeed, he has not already actually accomplished that great miracle. Of some of these things the world has heard but little, because the intolerance, jeers and ridicule of your majority have driven some of your greatest men into seclusion with their advanced experiments and demonstrations.

Come! Let us get God and Science into partnership, and really accomplish something! Let our scientists devote themselves to the problem of generating a wider range of ethereal vibrations, and an intelligent study of the effects of those vibrations upon different kinds of matter. They have accidentally stumbled into the border of this great field already; now let them till it and bring it to harvest.

The author is fully aware that this is a tedious and difficult chapter for the average man and woman upon whom rests the burden of the every-day affairs of life. This was understood before its writing was attempted, and has not been lost sight

of for a single moment. But the effort has been to so phrase facts and deductions that just such average men and women could comprehend them. The author is himself but such an average man, with all the burdens and cares of the complex workaday world resting heavily upon him, and this book is written in carefully husbanded moments which he is not compelled to devote to other things. This chapter might have been entirely omitted without impairing the general scheme, but it contains vitally interesting matter, and is in exact line with the other hypotheses and postulates herein adopted. If it has not been fairly comprehended, it ought to be read a second time. While some of its phases are rather technical and delicate, the gist of it is simple. Its purpose is to show that the great all-pervading God-force which we have been considering is responsible for all of life and growth and change in the world; that God not only created the heaven and the earth in the beginning, but that He is still creating, day by day, minute by minute, and second by second, and that without Him there is not anything made which is made; and that Science, by coming to a realization of this great fact, and intelligently coöperating with this great Force, will be able to perform miracles of which men have never even dreamed.

XV

SPIRITUAL MATTER, LIFE AND INTELLIGENCE

THE title of this chapter will probably cause our scientific friends who have been good enough to come with us this far to "go up into the air."

AN EMBARRASSING QUESTION

In order to bring those good friends back to the earth, the first part of the chapter will be devoted to an irrelevant question with which Religion has harassed Science since the first principles of Evolution were propounded, and which seems never to have been satisfactorily answered. Here is the question: If living matter was evolved from non-living matter by the play of natural forces, why is it that those same forces are not still causing life to spring up where none was before?

THE ANSWER

There may be more than one possible answer to this question, but there is one which seems to be flawless. Here it is: Because when life came it occupied the entire field, and uses up all the "raw material" before it reaches a stage of refinement at which it can be acted upon by the forces which

produced life in the first instance. Living matter can absorb non-living matter before such non-living matter has reached a stage of refinement at which it would spontaneously spring into life under the impulse of all-pervading force, and, having absorbed it, can rearrange its atoms and so refine it as to make it a part of itself. And living matter is everywhere. Whenever and wherever a molecule of solid mineral matter reaches a stage of refinement and complexity closely approaching the stage at which it might become a component part of a living cell, a living organism, either vegetable or animal, is lying in wait for it and immediately appropriates it. These living organisms abound everywhere, ranging in size from the smallest microscopical bacillus to the great redwood trees of California, and from the smallest microbe to the largest whale. In the time just preceding the rise of vegetable life this was not so. In that age the refining forces of nature might work mineral matter up ever so close to the proper state for the production of a vegetable cell, but until the proper state was exactly attained the cell refused to appear. Under those conditions it may well be imagined that much mineral matter at the surface of the earth attained to a high degree of complexity and refinement, and was great with life-inspiring potentiality. But when at last Nature had produced living entities through its refining processes, they not only took up the work of evolution from that point forward, but retroacted and took from

Nature some of the work theretofore done by it. In other words, the vibratory agitations and attractions of the atoms in the living cell create an induced ethereal vibratory rate in and immediately about the cell which is peculiar to it, and which hastens the refinement of other atoms which come within the zone of its influence, provided such other atoms have already been refined almost to the point of becoming living cells.

"But," says some patient biological chemist, "why does not life spring up in my test-tubes filled with nutrient material in which all forms of life have been killed? If there is an all-pervading wave-force in the all-pervading ether which once converted non-living matter into living matter, why does not that wave-force pervade my test-tubes and produce life in them?"

There are also several possible answers to this very pertinent question. It is just barely possible that our questioning friend cannot artificially duplicate in his test-tubes the exact conditions of refined mineral matter at the time life first appeared upon the earth. We can only speculate as to what were the conditions of mineral complexity, atomic tension and molecular activity, existing under the high potential of Nature's creative force just prior to its "discharge" in the creation of a living cell; and it may be that those conditions cannot be duplicated in a test-tube. But admitting that the exact conditions may be duplicated, there would still be open to our friend a range of possible blendings and con-

ditionings of his material running into the millions, and it is just possible that he has not yet guessed right. Anyway, the test-tube route does not lead anywhere. Suppose a certain sterilized composition should produce some microscopic mould; what of it? It would be interesting, it is true; and the materialists would probably jubilate over the discovery of the apparent fact that physical matter can produce life. But no practical purpose would have been achieved, and it might be urged with equal logic and reason that physical matter had merely been put in such condition that natural forces had produced life within it.

BIOLOGICAL SUGGESTIONS

It is respectfully suggested to our friend that he study the chloroplast, which is actually doing the work in which he is interested. Or he might go into partnership with a physicist, and endeavour to produce a form of ethereal radiation which will have a wave-length falling within the dark band between the yellow and green in the spectrum of sunlight. If such a wave-length, when produced, fails to accomplish his purpose, he might try to produce others which will fall within the other dark bands higher up in the spectrum of sunlight, and keep on so ascending until he reaches the place in the scale of wave-lengths usually assigned to the X-rays, which latter undoubtedly exercise a peculiar influence over the subject-matter of his quest. He may object that an almost superhuman task is set

before him in these suggestions, which may or may not be true. Science has measured some of the "fluorescences," or improvised wave-lengths, sent into the immediately surrounding ether by the atomic and molecular vibrations of several different kinds of matter, and has found that those improvised wave-lengths vary in different substances from about $\frac{1}{25000}$ of an inch to about $\frac{2}{10000}$ of an inch. In a few instances it has been found that such improvised wave-lengths are longer than the wave-lengths from which they are improvised. Thus, X-rays, which cannot be seen (supposedly on account of their extreme shortness), cause certain mineral substances to give off wave-lengths which can be seen; and certain ultra-violet rays, which cannot be seen on account of their extreme shortness, cause a solution of quinine to give off wave-lengths which manifest to the sense of sight as blue and violet. These are steps in the direction suggested. Our biological friend may suggest that certain ferments in the leaf, called "enzymes," seem also to have something to do with transmuting carbonic acid into sugar and starch. This is conceded; but what are enzymes? They are merely groupings of atoms in the leaf, which grouping is a part of the vibratory process. There were no enzymes in gaseous incandescence. They are the products of evolutionary force. There is no pretense of saying here that the suggested proceedings are simple, or that research in this field promises any immediate results. The aim is merely

to point to the principle involved. If by any chance our biological friend should discover the ethereal wave-length used by the chloroplasts to produce enzymes and sugar and starch, he might possibly improvise the same wave-length, by the use of which he would be able to convert much of the world's useless marble and chalk into sugar. And the men, women and children of the world who are toiling and struggling with the problem of getting something to eat would be very much more interested in such a result than in the production of mould in beef-tea.

The problem of reproducing the ethereal wave-lengths used by the chloroplasts is peculiarly a problem for physical scientists, in case that wave-length should be discovered and measured. Electricity promises much in that field, the ethereal wave-lengths produced by different applications of it covering a very wide range. But the shortest ethereal wave-length so far produced by electricity, which has been discovered and measured, is a little more than one-tenth of an inch in length, and on one such wave-length there could ripple along about fifty of the longest waves which have been found to be emitted by vibrating atoms and molecules. Therefore, if electric oscillations are to be employed in simulating the wave-lengths which the chloroplasts use in converting dead mineral matter into living vegetable matter, those oscillations must be almost infinitely quickened beyond any point so far attained. At the present time it

seems that the wave-lengths lying in the vicinity of visible light promise much more than do those produced by the oscillations of an electric current. It also seems that the X-rays, whatever may be their length, closely approximate the length required to change mineral matter into vegetable matter, because they do stimulate such change. Furthermore, the X-rays are not transverse, but move in straight lines; wherefore, their influence may not be attributed to possible secondary waves, because waves which move in straight lines produce no secondary waves.

The field is large, and knowledge is very scarce; but mineral matter becomes vegetable matter in the leaf, and nowhere else, and the little green chloroplasts accomplish the transition by playing upon the atoms of carbonic acid certain ethereal wave-lengths. Into whatever field of speculation we may go, we can always return to this fact for a fresh start. The production of the microscopic ferment-bodies called "enzymes" is a part of the process, and the carbonic acid may be transformed into formaldehyde before it becomes a true carbohydrate, but all these things occur in the leaf, and can occur there only under the play of certain wave-lengths of ethereal vibration.

Further exploration of this interesting realm must be left to specialists in Physical Science. Such specialists have already made excellent beginnings, though apparently without grasping the fundamental principle involved. A general student

of all branches of science can only make general suggestions, calling attention to the fundamental principle, and must leave the details to others.

SPIRITUAL MATTER

The pertinent and embarrassing question propounded by our hypothetical friend, the biological chemist, has thus led us quite far afield; but we will now leave him to ponder the proffered suggestions, while we proceed to a consideration of the subjects enumerated in the title.

Let it be freely conceded and understood that, with no further evidence than has already been considered, it is now going to be assumed that there is a realm of matter finer than physical matter interblending with the physical matter of this present physical world and possibly extending far out in space beyond it; that man possesses duplicate interblending material bodies, one composed of the coarser matter and one composed of the finer; that all the entities of the physical realm likewise have interblending ethereal or spiritual counterparts composed of the various grades of matter in the finer realm, thereby introducing into that realm the comparisons of heavy and light, coarse and fine, large and small, hard and soft, far and near, action and inaction, living and non-living, and so forth; and that men and women and children continue to live in that finer realm after the death of the physical body, in full possession of their individual intelligences, the general appearance of

their spiritual bodies being about the same as the general appearance of their duplicate physical bodies.

These things are assumed because men and women everywhere have believed them since the very dawn of human intelligence; because they are the fundamental postulates of all religious teachings; because wise men in many different countries and ages have left records of actual communication with such a realm; because they comport with many known facts, and appeal to conscience and reason as being proper; and because Science has made no single discovery, nor any number of discoveries considered in the aggregate, which in any remotest degree even tends to prove them untrue.

It will be observed that the enumeration of things upon which the assumption is based does not include any of the exhaustive experiments with Hypnotism and Spiritualism conducted by the English and American Societies for Psychical Research, which experiments have convinced many eminent scientists of its truth. Neither does the enumeration include the personal findings of many great men now living, who have from time to time confided to such as they deemed ready to receive it the information that they have rationally, independently and in full possession of their wits, come into conscious communication with this finer realm and its people. Such evidence would not be fair, because those great men are not avail-

able for cross-examination, and the probable truth or falsity of their testimony has not yet been subjected to the tests of time, changing conditions and expanding knowledge. All this mass of modern testimony is out of the case. All that we have heard and learned in recent years about "Spiritualism," "Occultism" and "Psychic Phenomena" is stricken from the record. The assumption of the existence of a realm of spiritual matter, life and intelligence is rested upon conceptions, intuitions and convictions which are time-tested and everywhere proclaimed, rather than upon discoveries which purport to be new, and which are corroborated by the testimony of only a few men. This may seem a perilous position to assume; but the aggregate of human intelligence is so shrewd at discerning the truth, and so prompt in discarding unmixed error, that it were better to rely upon the truth of world-old fundamental beliefs than to accept sporadic evidence which has not yet passed through the crucible of Time nor been sufficiently subjected to the searching flame of Reason. If such sporadic evidence happens to corroborate the world-old beliefs, it thereby becomes of interest; but until such time as our modern seers feel at liberty to give the public some details of the formula by which they have proceeded to build prophetic wisdom, their testimony should not be used in a controversy of the kind being waged here. It is conceded that they could not prove their assertions to average men and women, even

though they be abundantly true; for proof of the existence of a realm of spiritual matter, life and intelligence can come only through seeing that realm, observing the intelligent arrangement of its parts and functions, and communicating with the people who live there. Such proof is not available to average men and women of this age, and there is no recorded intimation that it ever has been available to average men and women in any age. Suppose an eagle living in a valley shut in by mountains should say to a ground-hog, also living there: "Beyond these mountain peaks there are level plains, and undulating hills, and green forests, and great rivers, and wonderful cities which are ablaze with light even after the sun has gone down." "No," the ground-hog might say, "such things cannot be. I have carefully scrutinized every cliff and peak many times, and I am quite sure there is nothing beyond them but empty space." "But," the eagle might insist, "if you will but soar with me I will prove what I have said." Since the ground-hog cannot soar, he could not receive the offered proof, and might crawl into his hole in disgust.

It is not intended to intimate that there is such disparity between the natural endowments of men and women that some may be compared to soaring eagles, while others must be compared to creeping ground-hogs; but the rank and file are eagles who have never learned to use their wings.

It is no part of the purpose of this book to prove

the existence of a realm of spiritual matter, life and intelligence. Its chief purpose is to show, by deductions from well-known facts and unquestionable scientific discoveries, that the world and everything in it was integrated and evolved, and still integrates and evolves, because it is acted upon from without by a great complex vibratory God-force, and that there is plenty of room among and between the ultimate particles of physical matter for the vibratory interplay of the ultimate particles of a finer realm of matter, which finer matter could not possibly be detected by the physical senses nor by any instrument made of physical material. If such a Force and such matter have been logically and rationally deduced, with no evidence to the contrary, then Science is out of the controversy, and Religion occupies the field—with all its rich treasure of ancient lore and sacred writings, its intuitions and deductions for the guidance of men and women over the difficult way of this present life, and its faith and hope and love for the edification of the living and the inspiration of the dying.

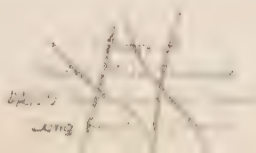
Having thus placed and conditioned the two realms of matter, life and intelligence, we are forced to realize, as perhaps we never realized before, that so long as Science remains Physical Science, and so long as Religion remains Spiritual Religion, the two must occupy entirely different fields. How foolish, then, is all this hurling of invective against invective, and launching of dogma

against dogma across the boundary line which separates them!

The next great truth which obtrudes itself upon our rapt attention, and which produces a shock of glad surprise, is the realization that the spiritual realm is no less material than the physical. It is merely composed of smaller particles, responding to shorter force-waves with more rapid vibrations; and in its aggregate manifestations to sight and touch attuned to sense it, it is just as firm and real as are the manifestations of physical matter to the physical senses.

If natural law operates uniformly throughout the universe, and if like causes always produce like effects, the aggregate spiritual realm is composed of matter of varying degrees of comparative fineness, manifesting in realms corresponding to the mineral, vegetable, animal and human kingdoms of the physical realm, the living entities of which are probably all but one time interblending counterparts of physical entities, the physical realm being generally conceived to be the seed-bed of individual life. The downward pull of gravity would not affect the finer matter of the spiritual realm to the same extent that it affects physical matter, and it is just possible that it may arrange itself in layers, or planes, with similar entities on each plane, one plane differing from another only in point of fineness and not in the general character of its entities.

This latter conception of different planes is a little difficult to intelligence accustomed only to the



things of the physical realm, but it can nevertheless be reasoned out by finite intelligence, and such arrangement corresponds with the several "planes" of Spiritualism, as well as with the idea of a "third heaven" which Paul intimates that he visited. An illustration will be attempted which, though crude and omitting many of the probabilities, may help us to understand the fundamental principle of those superimposed planes.

AN ILLUSTRATION

Suppose that into a jar or other vessel we should first put some chlorine gas, which is so heavy that it may be poured like a liquid; and suppose we then add some carbonic acid gas, then some oxygen, and finally some hydrogen. Of course, the hydrogen is lighter than air and would not stay in the vessel, unless the experiment should be conducted in a vacuum; but for the sake of the illustration we will suppose that it would stay. These four gases, each being lighter than the other in the order named, would arrange themselves into four distinct and clearly defined planes. Now let us suppose that certain very small animals and plants should be built up of the chlorine, and that they should grow and move about upon its surface. The carbonic acid gas could not be sensed by such animals, although it would be all around them. And let us suppose that yet other small animals and plants should be built up of the carbonic acid gas, and should grow and move about upon its surface. The

oxygen could not be sensed by these animals, although it would be all around them. And suppose that yet other small animals and plants should be built up of the oxygen, and should grow and move about upon its surface. Such animals could not sense the hydrogen surrounding them.

It is again cautioned that this crude illustration is not proposed as showing the exact conditions in the realm of spiritual matter, but it does exemplify known principles upon which the possibility of division into planes may be predicated. If we can conceive the possibility of each of these gases being many kinds blended together, instead of one, and of each possessing the characteristics of mixed solid, liquid and gaseous, so that their surfaces might be configurated, we get an alluringly beautiful picture of many planes superimposed upon each other, each manifesting hills, and valleys, and rivers, and trees and plants, and each suited to a particular degree of animate life—a veritable "house of many mansions" with a place prepared for each child of nature according to his fitness to inherit.

If the spiritual realm is in fact so divided into planes, the lower ones are probably inhabited by very "undesirable citizens," and if it be conceived that those lower planes occupy the vicinity of the earth's surface, with the material of which they are composed in closest coördination with physical matter, we can no longer wonder that "evil influences" are so rampant among men. Neither can we wonder that attempts to get into communi-

cation with really great and good men and women after their death, through the processes of Spiritualism, have usually resulted in failure or disappointment; nor can we longer wonder that the spirits who attend seances are so often ignorant and vicious, and prone to resort to subterfuges and false impersonations.

SPIRITUAL LIFE AND INTELLIGENCE

It is obvious that on planes of the kind here pictured there is work to be done, lessons to be learned, responsibilities to be discharged, pictures to be painted, music to be written and rendered, songs to be sung, and people to be loved; the higher and happier activities here enumerated being confined, of course, to the higher planes. On the lower planes life is beset with trials and difficulties, and is conditioned to environments more terrible in the abandonment of their depravity than mortal man can imagine. "Weeping and wailing and gnashing of teeth" are about as strong words as can be used to describe the hopelessly penitent side of life in the lowest strata of the spiritual realm, and its hopelessly aggressive and defiant side probably could not be depicted in any terms which mortal men could understand. Whether the wretched men and women who dwell in those lower regions may yet evolve, through payment of the "last farthing" and compliance with the laws which they have thitherto violated, is a question which is variously controverted in the ranks of Religion itself,

and renews the clash, already referred to, between the dogma of Eternal Damnation and the concept of a university of law. Let us trust that of such as these were "the spirits in prison" to whom Peter tells us Jesus preached, and that His message was one of love and hope.

CHILDREN OF HEAVEN

Since children are constantly dying here in the physical realm; and since their spiritual bodies, being counterparts of their physical bodies, must still be children on the spiritual planes to which they go, innocent, ignorant and helpless, needing loving hands to care for them and loving arms to cuddle them; the one activity alone of caring for the children and bringing them up to manhood and womanhood must require the services of a vast number of people on the higher planes. But service amid the happy and exalted conditions of those planes, where men and women have learned the great secret that happiness can be attained only through service to others, must be considered such a glorious privilege! Many children, of course, find mothers and other loving kinspeople ready, able and willing to care for them, but in the majority of cases there probably is no one both willing and able among the little stranger's kinspeople, and it must therefore go into other care.

There are numerous Biblical references to children in the spiritual realm, and one of the prophets said of the heavenly city that the children played

in its streets. Certainly such children are not waifs and outcasts in that glorious realm of abounding love. Surely there are those who love them, and cuddle them, and train them.

This may come to the notice of some disconsolate mother who has recently kissed two cold chubby hands for the last time, and brushed into place upon a lifeless little forehead the baby curls which were once her joy and delight; and it may be that upon reading it her conscience and heaven-born intuition shall approve it, so that her tears of sorrow shall be washed away by tears of gladness through which she shall look up and thank God that there are glorified mother-hearts and mother-hands in heaven. She did not want her baby to be an angel with wings and a golden harp. She preferred to think of it as her own sweet baby boy or girl. What has here been said may help her to realize that her preference lays hold of the truth, and that her baby went into the care of some sweet and gentle woman whose love and kindness pass human understanding, in whose mind there is no lodgment for impure thoughts, envy, jealousy, or anger, and who will keep and care for that baby against the time when its now broken-hearted mother shall join it in the realm of which the Lord God Himself is the glorious and unfailing light.

DEATH

Since both the physical and spiritual bodies of a man are apparently operated and controlled by a

separate ego, or soul, which seems to use them merely as its instruments of expression, and which passes away with the spiritual body at the death of the physical, it becomes apparent that the individual man or woman is neither better nor worse immediately after the death of the physical body than immediately before. Since this soul-entity is the seat of wisdom, the man recently entered into independent life in the spiritual realm would know nothing more than he knew in the physical body, excepting only such small knowledge as he might have gained in making the transition. And the amount of knowledge gained in the actual experience of death must usually be *nil*, because the average human being is totally unconscious of what is transpiring during this rather important process. He has never learned to use the organs of sense of his spiritual body, and is therefore unconscious of things in the spiritual realm. For varying lengths of time before the actual separation of the two bodies, his physical organs of sense are "out of commission," and he is therefore unconscious of things in the physical realm. In other words, he is in the same condition as the man pictured in a previous chapter as having only the two senses of sight and hearing, and having his eyes bandaged and his ears stopped.

There are some notable exceptions to this general rule of unconsciousness during the event of death. Men and women sometimes live long lives of purity and morality, and thereby develop their spiritual

organs of sense to a point at which intuition becomes almost actual knowledge. Then "senile debility," or some slowly wasting disease, wears away the tissues of the physical body to a point at which it is but a "veil" separating the spiritual realm from the spiritual senses. In such a case the near approach of death is usually heralded by a marked "damping" of the physical senses. The surface of the body grows cold, and the sense of touch becomes sluggish. The sense of hearing grows dull, and the sense of sight becomes dim. But the subject is often in full possession of his wits; he asks his friends to speak louder, and complains of darkness even at noonday. At just this stage the spiritual eyes sometimes peer through the "veil," and the spiritual ears pick up the sounds from the spiritual plane. The dying man is then no longer in darkness, but proclaims the breaking of a great flood of light by which he discerns some of the outlines of the splendid world which he is approaching, and sometimes recognizes the forms of friends who have thither preceded him. Cases of this kind have either come under the immediate observation of all of us, or else have been reported to us by those who did actually observe them.

Some day the silver cord will break,
And I no more as now shall sing;
But, oh, the joy when I awake
Within the palace of the King!

When the venerable and saintly Fanny Crosby

wrote the lines just quoted, she propounded a wisdom which is something other than a mere product of physical matter. Such sentiments are no part of oxygen, hydrogen, carbon, nitrogen, phosphorus, sulphur and iron. Her faith and intuition had reached a stage so closely approaching actual knowledge that she thus briefly stated the most important scientific fact in the world.

JUST THE OLD TIME RELIGION

Considered singly, the different statements and deductions of this chapter concerning spiritual matter, life and intelligence, may seem strange and weird. But considered in the aggregate, they are merely "The Old Time Religion." Men and women have not been accustomed to talk and think Religion in scientific terms. While they have believed these things all the while, in a general sort of way, it has not usually occurred to them that the spiritual realm, in which individuals live and move about, must be a material realm, occupying space and having parts. Not being able to sense such a realm, nor to see any material entity withdraw from their dying friends; and being unwilling to admit in the face of Intuition, Faith, Hope and Religion that death ends all; they have loosely entertained a half-formed idea that a spirit is a kind of a filmy something made of nothing. Such a conception will not stand the light of reason, and so it is that many good men and women who have dared to reason have become doubters,

or worse. The anomalous spiritual beings thus loosely conceived of by religionists have been variously represented as having wings and flying through the celestial atmosphere; as wearing bejewelled crowns; as twanging harps and singing hozannas; as enjoying everlasting rest and inaction; as forever bowing before a great white throne and lauding its occupant; and as marching about over the streets of a city paved with gold. None of these occupations appeal very strongly to normal men and women, but they are so far better than being forever barbecued in a caldron of fire and sulphur that they have nevertheless been striven for in various ways and with varying degrees of zeal.

And yet, so great is the ability of human reason and intuition to discern the truth, that, despite all these imaginative and allegorical frills and furbelows which have been from time to time draped about the fundamental fact of life after death, men and women have intuitively hoped, and dreamed, and believed that the spiritual realm is a place where old friends meet, where severed ties are mended, where love comes into its own, and where people will have an opportunity to do the work and learn the things which they wanted to do and learn here—a glorious land where happy dreams come true, where ideals become realities, and hopes materialize.

Religion is thus glorified and exalted by being expressed in rational scientific terms. How truly

must Paul have spoken when he said man had not sensed, nor had his mind even imagined, the great and good things which God has prepared for those who obey His laws!

XVI

MORALITY

BY a process of gathering facts and reasoning from them, and by adopting the fundamental postulate of Religion that there is a realm of matter, life and intelligence finer than the physical realm, we have been led to the conclusion that man is a combination of two interblending material bodies, both operated and controlled by some kind of an intelligent ego, soul, or mind. We have also hastily observed that this intelligent ego exercises a powerful influence, for weal or woe, over the bodies which it operates.

MIND

Just what the soul or mind is, we do not know. But we do know that its states, phases and conditions determine, in large measure, the condition of its physical body. We know that it can consciously transmit messages from the brain over certain nerves to the different parts of the body, just as men transmit messages over telephone and telegraph wires, and that it employs for this purpose a vibratory force called "nervous energy" which is very closely related to magnetism and electricity. We know that it unconsciously, or subconsciously, sends a vast number of messages to vari-

ous organs of the body, and that these unconsciously transmitted messages also travel along certain other nerves in the form of nervous energy. It consciously transmits a message to the muscle controlling a finger, instructing it to move. It also unconsciously sends out the thousands of messages directing the heart to beat, the muscles of the chest to move, the liver and kidneys to act, etc., etc. If the trunk nerve leading to any muscle or organ be severed, that muscle or organ, be its action of the voluntary or the involuntary kind, is immediately paralyzed and its functions cease.

We have never been able to discover the subtle difference between the messages transmitted consciously and those transmitted unconsciously, excepting only that the messages which are transmitted unconsciously are sent from the lowest part of the brain, consisting of the *medulla oblongata* and the base of the *cerebellum*, while the messages that are consciously transmitted are sent from the higher and more frontal parts of the brain. Consciousness and Intelligence dwell in the higher and more frontal parts of the brain, and seem to dictate the messages sent out from those points, while the subconscious part of the mind, or soul, occupies the rear and nether portions, and dictates the messages which are sent from those stations. It is all very mystifying; but the division of labour is nevertheless wise, for it leaves the greater portion of the brain free to think, and learn, and attend to the many voluntary activities of life.

STATES OF MIND

And yet the conditions of the conscious, intelligent part of the mind exercise a marked influence over the subconscious, sub-intelligent part. The smell of food affects the flow of saliva and digestive fluids; fear and anger so modify the beatings of the heart as to blanch or flush the face; and constant worry and dread so affect the functions of the kidneys as to produce Bright's Disease. Somewhere in this wonderfully delicate machinery the wires are so strung, or the batteries so placed, that the passage of currents of nervous energy over the nerves of the conscious and voluntary system produces "induced currents" in the nerves of the unconscious and involuntary system, in something like the same manner as the passage of a current of electricity along a wire induces a current in a parallel wire, or as the bringing of a body charged with electricity into the presence of another body induces a charge in the latter.

THE SCIENCE OF MORALITY

And we here come to another ultimate—another one of those things which just are, and that is all we know about them. Such states of mind as purity of thought, sense of innocence, honesty and benevolence of purpose, kindness, humility, gentleness and love, send through the two bodies of the individual vibratory impulses of such wave-lengths and amplitudes as make for the refining and well-being of those bodies. These vibratory rates har-

monize with the all-pervading force-waves, and give an added impulse to their evolutionary and refining influence. But such states of mind as impurity of thought, sense of guilt, malevolence of purpose, unkind feeling, vanity, anger, jealousy, fear and hate, send through the two bodies vibratory impulses of such wave-lengths and amplitudes as make for the coarsening and ill-being of those bodies. These last mentioned vibratory rates do not harmonize with the vibratory rates of the all-pervading wave-force, but produce discords which defeat their evolutionary and refining influences and tend to undo the work already done. Therefore, the "workers of iniquity" are not kept out of the kingdom of heaven by any arbitrary ruling, nor by any angel with drawn sword, but because they are inherently unable to enter and unfit to occupy.

Many good people, intuitively sensing the fundamentals of the great law here immediately under consideration, have attempted to carry its application further than the known facts would seem to warrant, and have assumed that all physical ailments have their source in the mind—that they are but errors of thought. That this conception is correct in many instances, there is no slightest room for doubt. That it is correct in all instances, the known facts seem to controvert. Heart disease may be, and often is, caused by mental conditions; but it is also often produced by the entry into the body of the germs of typhoid fever, and by other causes equally as distinct from mental processes.

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The same things may be said with equal truth concerning many other physical ailments. The germs of diphtheria and measles enter and poison the bodies of children too young to have formed habits of wrong thinking, while malaria and smallpox and yellow fever attack the saint and the sinner with equal virulence. The physical bodies of moral lepers are often remarkably healthy—and brutally coarse in form and fibre; while the physical bodies of the most saintly people are not infrequently frail and pain-racked—and remarkably refined in form and fibre.

It therefore seems that while wrong thoughts and motives may produce physical disease, they do not always have that effect; and that while physical disease may come by reason of wrong thoughts and motives, it is not always attributable to that cause. Maybe the mind of man shall some time evolve to a state at which it will be able to regulate all the internal affairs of the physical body, and also to repel the invasion of germs and poisons of disease which attack it from without; but at present it has not attained to that ideal condition, and we must here deal with the facts as they actually exist.

But the wrong thoughts, motives and mental states which have been enumerated always register their effects upon the two bodies, and those effects, while not always the same, are always harmful. They may be disruptive in some cases, but they are always coarsening, degrading and devolutionary,

driving the individual backward on the evolutionary way over which he has come to the soul-inspired estate of man, and unfitting him for habitation of the mansions which have been prepared for him. And the right thoughts, motives and mental states which have been enumerated also always register their effects upon the two bodies, and those effects, while not always the same, are always beneficial. They may be literally constructive in some cases, but they are always refining, uplifting and evolutionary, impelling the individual forward and better fitting him for citizenship in the kingdom of heaven.

PHILANTHROPY

It may occur to the thoughtful and analytical reader that in this scheme of "scientific morality" all of charity and benevolence and philanthropy must go for naught. A full treatment of this phase of the subject would require considerably more time and space than can be devoted to it here, but one illustration will be given which will lay bare the fundamental principle. In the illustration the lights and shadows will be brought out in sharp contrast, but the principle runs through all degrees of shading. Suppose a well-to-do man who could enter his home on a cold evening, eat a bountiful dinner, retire to a cozy room to read and smoke, and finally lay himself down on a warm and comfortable bed to sleep; all the while unheeding the fact, well known to him, that a sick widow and her three

little children, living in a hovel of a house just around the corner, had no food, no fuel, and no sufficient clothing.

There would be something so radically wrong with such a man that any normal person would observe it at a glance of the situation. And that "something wrong" would be one or both of two things: he would be either grossly selfish, or else carelessly indifferent to the welfare of others—or both. In either case his mental state or condition would be in violation of every principle of pity, compassion, mercy, love and altruism, and would generate and transmit to every fibre and atom of his body vibratory streams of nervous energy in jangling discord with the natural vibratory force which tends to refine men and make them God-like. The people and the conditions in this illustration may be changed in an almost infinite number of ways, but so long as we maintain the relation of those who need and those who know and are able to help, the principle remains the same, whether the need be of food or of kind words.

CODES AND CREEDS

This idea of reducing morality to a scientific proposition of force acting upon matter will be new to many readers, but it fits in snugly with the known facts and falls exactly in line with the major hypotheses upon which this book is founded. Moreover, it appeals to Reason, and is sanctioned by Conscience. It will be observed that it deals

altogether with things which are right or wrong in their inherent nature, and altogether ignores those things which are merely commanded or prohibited in codes and creeds. Codes and creeds command the doing of many inherently right things, and prohibit the doing of many inherently wrong things; but the mere fact that a thing is commanded or prohibited does not make it right or wrong. However, there is one phase of this subject of codes and creeds which cannot be neglected. Many people have been so taught and environed that they depend very largely upon codes and creeds for their moral standards, and when they violate them, believing that they are thereby doing wrong, there comes into their consciousness a sense of guilt which is degrading and devolutionary, without reference to whether or not the act was inherently wrong. Paul understood this problem in scientific psychology quite well. He said that, so far as he was personally concerned, he did not believe it wrong to drink wine in moderation, nor to eat meat which had been sacrificed to idols, and that he could do these things without sin; but that many people believed it to be wrong to drink wine, or to eat meat which had been sacrificed to idols, and if he should set the example they might follow it against their consciences and thereby commit sin.

WRONG IS ALWAYS WRONG

There is another phase of this great subject of morality which demands attention. Wrong is al-

ways wrong, and is always harmful, regardless of the belief or ignorance of the wrong-doer. Fire burns the hand of the innocent and ignorant child just the same as it burns the hand of the experienced adult. Poison swallowed by mistake kills just as surely and just as swiftly as if swallowed with suicidal intent. This idea may also seem new, and even harsh, to many good people; but as a matter of fact it is so universally sensed and recognized that in the affairs of men it has crystallized into the world-wide legal maxim, "Ignorance of law excuses no man."

It has sometimes been supposed that Jesus proclaimed a principle antagonistic to this conception of responsibility for ignorant violation of moral laws, and His reference to the servant who knew his master's will, and to the other who did not know it, has been often cited to show that in matters of morality ignorance of law is a complete defense. He said: "The servant who knoweth his master's will, and doeth it not, shall be beaten with many stripes; but the servant who knoweth not his master's will, and doeth it not, shall be beaten with few stripes." It will be noted He did not say that the ignorant servant would be vindicated on account of his ignorance, but that he should also be beaten, his ignorance availing only to reduce the degree of his punishment. If a man ignorantly violates a moral principle, he thereby injures himself. A drunken debauch, or a self-abandonment to lust and sensuality, are injurious and debasing, regard-

less of the actor's ignorance of the wrong he is committing, and for these things he shall be beaten with the number of "stripes" which the moral law of nature prescribes as a penalty for them. The attitude or phase of mind which prompts him to do such things is wrong, regardless of his ignorance of moral principles, and this wrong mental state transmits coarsening and devolutionary forces to his entire being. But if he should do these things in spite of knowledge that they are wrong, then there would come into his consciousness a sense of guilt and self-condemnation, which is also degrading and destructive, and which would inflict many "stripes" in addition to those inflicted by the mental attitude which prompted the wrong-doing in the first instance.

It may seem, at first thought, that a law which imposes penalties upon those who ignorantly violate it is a harsh law; but all human laws are of that kind, and it is a matter of common knowledge that ignorance of natural laws is responsible for the greater part of the suffering and misery of the human race. Man is confronted in life by a labyrinth of ways, some of them right, and some of them wrong. If he chooses a wrong way, either ignorantly or knowingly, he sooner or later finds himself in a bramble-patch or a bog, and may thereby be made to realize the mistake or folly of his choice. It is then incumbent upon him to decide whether he will remain in the bramble-patch or the bog, or whether he will retrace his steps and

get on the right way. If his choice of the wrong way be a mere mistake, he is usually prompt in retracing his steps and diligent in repairing the injury he has sustained. But if his choice of the wrong way be with knowledge that it is wrong, he is slower in returning, and his initial injuries become infected with the poisons of the realm into which he has gone. In either case, however, he has learned something. If he chose the wrong way by mistake, he has learned that such ways are wrong; and if he chose it knowing it to be wrong, he has learned that wrong ways lead to disaster. These things are lessons in the School of Experience, and some people can be educated in no other. Since knowledge of one's being and well-being is necessary to that full growth and development requisite to citizenship of the kingdom of heaven, these lessons may be put to good use. If the man who ignorantly chooses the wrong way should be spared the penalties on account of his ignorance, he might spend his entire life in purposeless wandering; but the bramble-patches and the bogs reveal his error while there is yet time and opportunity to return to the right way and make heavenward progress.

Therefore, the law which at first thought seemed harsh is really a benevolent and corrective law, tending to keep men upon the way which leads onward and upward to light and life and happiness.

Morality is thus reduced to an exact science, and

the laws upon which it is based are brought within the range of human comprehension. And it is all wrought out of the fundamental proposition that matter is acted upon and refined or coarsened by force playing upon it from without. It is all very wonderful and very beautiful, and when we once comprehend its fundamentals, we are able the more fully to appreciate the possibilities lying before the soul-inspired free moral agent equipped with everything necessary to enable him to work out his own salvation and become inherently worthy of immortality.

XVII

SIN AND REDEMPTION

MAN early realized that Nature keeps books against him, and that in some mysterious way he is personally responsible for his acts. He found that "he who lives by the sword shall die by the sword," and that "whatsoever a man soweth, that shall he also reap." Then there developed something within his mental equipment which he calls "Conscience," which constantly reminds him of his misdeeds and shortcomings and warns him of penalties entailed. He found that every time he wronged his neighbour a sense of guilt fastened itself upon him, and that indulgence of greed, sensuality, lust, hate and anger sowed the seeds of discord and produced a crop of weeds and tares which tended to choke those higher impulses that make for happiness and well-being.

From these beginnings he worked out a moral code consisting largely of inhibitions. Later on he realized that his moral duties and obligations were not all negative, but that some measure of service was demanded of him; and then he enlarged his moral code accordingly, and is till enlarging it as he comprehends his duties and responsibilities more clearly.

But notwithstanding the inhibitions and commands of this moral code, men found that they continued to do many things they ought not to have done, and did not many of the things they ought to have done. Alluring temptations beguiled them, the sharp passions of unguarded moments were stumbling-blocks, and when they willed to do good evil was present with them.

SACRIFICE FOR SIN

Realizing, then, that certain kinds of conduct were wrong, and invoked penalties which must be paid in full some time, somewhere, in the currency of some realm; and finding that it was exceedingly difficult to leave off wrong-doing; man faced a very disquieting situation. There seemed to be just two courses open to him. He could follow the difficult path of rectitude and morality, thus incurring no penalties; or he could do his dance and pay the fiddler. He naturally sought diligently for some third way, and finally hewed one out through the jungle. The scheme he worked out, and the processes of reasoning employed in evolving it, were very ingenuous. Realizing that sin entailed a penalty of suffering, and that only a certain amount of suffering could come as a penalty for a certain sin, he concluded to have some one else suffer in his stead. This "some one else" was usually a goat or some other animal, but was sometimes a human being. Death being the most terrible penalty he could conceive of, and in order

that there might be no underestimate of the amount of suffering necessary to pay the penalty for his sin, the victim was always killed; and, in order to be entirely unselfish in the transaction, its dead body was presented to God in the form of a sacrifice.

This first more or less well-reasoned idea of vicarious atonement developed into various forms, with many modifications, until the original reason and purpose of it were largely lost sight of, and it became a mere ritualistic ceremony passively accepted as a method of obtaining forgiveness of sins. The prospect of an easy and unscathed escape from the penalties of sin is very enticing, and the men charged with the duty of shaping and administering the policies of Religion have made the most of it. It forms a part of nearly every religious system in the world. In the Christian Religion there is no longer any slaughtering of bulls and goats as a sacrifice for sin, but it promises immunity from the penalties of sin through the sacrifice of its Founder, the theory being that He was so good and so great that His death was sufficient to relieve all men for all time from the consequences of their sins, if they will only accept a share in the sacrifice made by Him.

It is no part of the purpose of this book to attack any cherished religious creed, but we are here considering Religion from a scientific standpoint, and in order to be consistent we must apply the same tests to every question which it becomes necessary to consider. The doctrine of vicarious atonement is a beautiful doctrine, containing much that ap-

peals to the loftier natures of men and women, and having many parallels in every-day life. Like every other tenet which has ever come into wide popularity, it has an element of truth in it; but in the very nature of things it would indeed be strange if it had not been overdone. While it has in it an element of truth, yet the generally accepted idea that it offers an immediate and ever ready escape from the penalties of sin does not fit very well into a conception of things containing the postulate that a man's actions and thoughts register their effects upon his individual being, giving him a certain high or low degree of inherent fitness.

Without in any way disparaging the noble life and loving sacrifice of Jesus, it is possibly not too early in the day of Divine Knowledge for some one to undertake the delicate and unwelcome task of timidly suggesting to men and women that they carefully examine the time-honoured teaching that they can hide their devilment behind the Cross and rid themselves of the stains of sin by calling for an application by the blood of the Lamb. Deep down in their innermost consciousness they already have some doubts about it, but the doctrine is such a convenient solace that they are inclined to scoff their better judgment in order to retain it. Since the days of Calvin and Luther, at least, it has been recognized that "hell-scared Christians" are a very poor sort. Those who are driven to Religion merely because they are frightened at the gathering doom which their sin has invoked, and in the

hope of finding an easy way to escape that doom, are very poor recruits, and the fact that they nearly always desert strongly indicates that they fail to find what they seek.

Considered from a scientific standpoint, the true remedy for those who are afflicted with sin would seem to be to send them out into the sunshine of Divine Love and the pure air of morality, there to learn, and do, and become, until they attain to the healthy stature and fineness of being assigned to them in the great scheme of things.

So long as men and women continue to believe that they may run a long course of immoral conduct, with the privilege of mending their ways at any moment and getting an "immunity bath" against the consequences of all that has gone before; just that long will sensuality, and lust, and greed, and dishonesty, and hate, and neglect of the rights and happiness of others, run riot through the world—just so long will private vice and public iniquity be the shame of the people. But let them once come to fully and conscientiously believe that they are bound to pay the penalties of their evil conduct, sooner or later, some time, somewhere, and that they can never be cured of the injuries caused by sin until they have literally worked out the penalty by right living, right thinking, and service to others; and a wave of reform will sweep the earth, the like of which has never been seen before. Such a revolution would put Religion out of the business of dispensing nostrums and cure-

alls; but if it should prove worthy of the opportunity thus presented, it would come into immediate recognition as the great consulting specialist in soul sickness and sin-injury. It would prepare and promulgate plans for moral sanitation, direct the localizing of vice-infections, and point out natural and efficient methods of healing sin-sores. Moreover, men and women would hear it gladly, and would vie with each other in complying with its directions; whereas, under the present general conception of the doctrine of Atonement, they feel that, since the "immunity bath" is ever easy of access and certain in results, there is no hurry, and so plod along in the evil tenor of their ways.

THE LAW AND THE REASON

There is an all-sufficient reason why individual "regeneration" and "salvation from sin" must be wrought out by the individual himself, and that reason is nothing other than man's rightfully boasted Free Moral Agency. The individual mind is the initial point of infection by sin. The mind infected by dishonesty of purpose, greed, lust, anger, fear, or hate, is not "in tune with the Infinite." It is in a discordant state, and its discord spreads out to every tissue, fibre and atom of the material instrument occupied by it. This discord destroys the harmony which makes for well-being and progress, causing the evolutionary process to double back upon itself and become a devolutionary process. We all know how dread

and worry and anger interfere with the functions of appetite, digestion and nutrition, and how they sometimes produce fatal diseases of the heart and kidneys and other vital organs. Selfishness, and dishonesty of purpose, and lust, and greed, and hate, and envy, and malice, all make their initial attacks upon the mind and find their first lodgment there; and then they transmit their discordant vibratory influence to the material instrument occupied and controlled by the mind, registering those discords in lasting injurious effects. Some of the discordant mental states which seem slowest in registering their effects produce injuries, disintegrations and coarsening which are most difficult to remedy.

And so it is that sin, in its essential nature and last analysis, is a mental condition; and the overt acts which are usually recognized as "sins" are but the evidence and manifestation of its existence. Jesus was thoroughly familiar with this great scientific truth, and proclaimed it in no uncertain terms. Said He: "Whosoever hateth his brother is a murderer"; and "Whosoever looketh upon a woman to lust after her hath committed adultery already in his heart."

But the commission of the overt acts usually called "sins" also produce mental states which are harmful in their effects. They either engender a mental state known as "a sense of guilt," or, what is still worse, if long persisted in they produce a callous indifference which drags the individual far down the devolutionary declivity. Therefore,

while hate is murder, and lust is adultery, the commission of the overt acts which are the efflorescences of this "original sin" creates other mental states which add to the aggregate burden. Thus the sinner who manifests his sin by action creates within himself that condition which the doctors call "a vicious circle." By every wrong act he augments his stock of sin, and each augmentation of his stock of sin inspires fresh outbreaks of wrong acting; so that he literally "goes from bad to worse."

Since sin is essentially a mental condition, producing ill effects in all parts and departments of the individual, it is obvious that the only channel through which those ill effects can be reached and remedied is the mind itself. If a man's hand is being crushed by a heavy weight, liniments and lotions will avail nothing unless the weight be first removed. And whenever a man's mind is reached and controlled, he loses his free moral agency and drops down the evolutionary scale to a point far below the estate of humanity. Wisdom and ignorance and good and evil may be placed before him for his choice, and the advantages of a certain choice pointed out to him; and he may choose, however unwisely, and still be a man possessed of free moral agency; but whenever his will is overcome and a choice, however wise, is thrust upon him, his free moral agency is gone. And it is the inflexible law of the great scheme of things that free moral agency shall be one of the badges distinguishing man from the rounds of life below him.

Take away that badge, and you do him a greater injury than his sin can ever do him; for you thereby cut him off from among men and plunge him back to the level of the unmoral, irresponsible and impermanent brute. This is the monster crime of Hypnotism and Spiritualism, and sin can be "forgiven," in the commonly accepted sense of the term, in no other way.

There are probably spiritual men and women wise enough in their understanding of the subtle forces of nature that they could take control of the individual mind and force upon it an attitude which, all things else being equal, would result in repairing the ravages of sin. But all things else are not equal, and the remedy would be worse than the disease. The operation might be successful, but the patient would die—mentally and morally. The effort would be to improve his morality; the result would be to destroy it. The penalties of sin can be worked out only by the individual mind, or soul, and moral regeneration must begin with mental regeneration.

And yet, Jesus came to seek and to save that which was lost. His blood was shed as a ransom for many. He was born, and lived and died, in order that men and women might obtain forgiveness of their sins, and thus escape the terrible penalties of Retributive Justice. He came to teach men how to repair the havoc wrought by sin within themselves, and how to live and act and think so as to prevent this havoc. Men had supposed God to

be a jealous and vengeful creature. Jesus came to teach them that God is all-creative Love, and that the penalties of sin are merely inherent individual results of violation of its principles, rendering men and women unable to enter and unfit to occupy the kingdom of heaven. And in order to exemplify the all-serving, all-sacrificing character of the Love whose special envoy He was, and in order that the story of His work and teaching might be perpetuated among men, it was necessary for Him to forfeit His life. He did not come in order that a man might have license to steal his neighbour's horse, or elope with his neighbour's wife, with assurance that his sin would be washed away by the blood of the Lamb at any moment he might choose to have that blood applied. He came, rather, to inveigh against sin, and to teach men how to go about repairing the damage done by it to themselves and to others. His mission was not to destroy natural law, but to fulfill it; not to place Himself as a shield between men and the consequences of their sin, but to teach them the disastrous folly of sin, and to give them a moral formula for repairing the damages wrought by it.

THE PRINCIPLE ILLUSTRATED

Suppose a man should negligently or wilfully plunge his foot and lower leg into boiling water, thereby violating one of the natural laws governing his physical body and invoking a severe burn as a penalty. And suppose he should call in the family physician, and a consulting physician or two be-

sides. Those learned physicians, understanding but little about the real nature of a burn, would probably apply a dressing of linseed oil and lime-water; but the peculiar torturing pain incident to the burn would continue, and the adjacent tissues would keep on breaking down and generating toxins to endanger the patient's life by attacks upon his kidneys and intestines. The emollient dressing would do some good, though it would not take away the peculiarities of the burn. But suppose there should come upon the scene a scientist possessed of the knowledge that heat is merely one form of ethereal radiation, and that if its greater amplitudes be played upon animal or human flesh it disturbs the harmonic vibratory relations between the atoms and molecules of which the cells of flesh are built up, thus setting up an induced radio-active discord which continues after the heat has subsided, just as the induced radio-active effects of the X-rays remain in the bean-vine long after the rays themselves have subsided. And suppose the scientist to be possessed of the further knowledge that one part of pure lard and one part of gum turpentine heated together until they are fuming hot, and then supplemented by the addition of one part of spirits of turpentine, blend into a highly complex compound which is itself radio-active to just the degree necessary to break down and neutralize the radio-activity induced in the flesh by the heat. And suppose he should impart all this knowledge to the suffering man. If the materials should happen to be at

hand, and if the man should be sufficiently impressed to induce him to try the experiment of preparing this compound, and applying it when cool in the form of a thoroughly saturated cloth or gauze, closely binding it up with another cloth so as to exclude the air, all the peculiar torture of the burn would disappear within a few minutes. And by a renewal of the dressing once a day for two or three successive days, the burn would be made to assume the form of an ordinary injury of the same extent. The physicians would probably tell him that the scientist's talk about vibrations, and atomic harmony and discord, and induced radio-activity, was all just so much "pure mush"; that the very idea of treating a burn with hog-fat and pine-juice is ridiculous: and that, anyway, the application of so much turpentine to the injured surface would result in the absorption of that drug and the consequent disintegration of his blood.

Now, the man with the burned leg may be likened unto mankind suffering from the effects of sin; the doctors, ignorant of the real cause of the trouble, and applying linseed oil and lime-water, may be likened unto the priests and elders who pottered around with sacrifices, and burnt offerings, and purifications; and Jesus, knowing the real cause of the trouble and the remedy for it, may be likened unto the scientist. And thus it is that "he taketh away the sin of the world." He knew that sin coarsens and stupefies and disrupts the very fibre of the spiritual body, as well as of

its physical counterpart, thereby dooming it to unhappy environments. He knew that the remedy lies in living a life of purity and righteousness, in words and thoughts and deeds; and so he promulgated a code of ethics ranging from the simplest rules of conduct to standards so sublimely high that men cannot even yet understand their full meaning and significance. His Gospel does not force men and women to remain perpetual mendicants at the door of Grace and Mercy, but instructs them in methods of self-help which will make them strong, and courageous, and worthy. Hear His words of wonderful wisdom thundering down the corridors of Time: "Not every one that saith unto me, 'Lord, Lord,' shall enter into the kingdom of heaven; but he that doeth the will of my father which is in heaven. Many will say unto me in that day, 'Lord, Lord, have we not prophesied in thy name? and in thy name have cast out devils? and in thy name done many wonderful works?' And then will I profess unto them, 'I never knew you; depart from me, ye that work iniquity.'"

Calling upon God and acknowledging Jesus as Lord will not get sinful men and women into the kingdom of heaven; they must do the things which the great God of all being requires of them, and thereby become the things which alone can enter that kingdom. They that work iniquity have all their ritualism and professions and prayers for naught.

How beautifully simple! How simply beautiful! Just a matter of doing and becoming, according to the moral formula for which Jesus shed His blood. Just a matter of trying to live up to our highest ideals every day. Just a matter of loving, and laughing, and singing, and serving, as we wend heavenward over the road along which play the splendid lights of the Transfiguration and the sombre shadows of the Cross.

The author is not afflicted with the delusion that this chapter will meet with general popular approval. Quite to the contrary, it is well known in advance that it will meet with much bitter disapproval and hostile and aggressive criticism. By many it will be regarded as a sacrilege, by many others as a pernicious intermeddling with things that are sacred, and by not a few as the very sin against the Holy Ghost. The great majority of the men and women of Religion have too long relied upon the merit and sacrifices of others to take away the consequences of their sin to be thus easily shaken from such reliance.

But we have seen that the whole scheme of evolutionary growth and development depends upon individual harmony with the all-pervading Force. We have observed that Man has been made a free moral agent, with power either to comply with the great law or to violate it, and that his compliance or violation registers effects upon his inherent individual being. We have also seen that spiritual light and knowledge can come only

through individual compliance with the immutable natural laws which have to do with morality, and that through an understanding of and compliance with those laws a man or woman may so evolve and develop as to come into independent and rational communication with the realm of spiritual matter, life and intelligence, thereby attaining to prophetic wisdom and verifying the continuance of individual life after death. We also know as a matter of common knowledge that at the present time men and women are not attempting to rationally and purposefully comply with the natural laws of morality, and that it is not generally understood that such rational and purposeful compliance leads to knowledge of spiritual things.

These are the reasons which prompt the writing of this chapter, and not a vain desire of the author to adversely criticize any religious belief. The suggestions here made are put forward in all humility, and with all respect and reverence for the beliefs, sentiments and feelings of others. The matter is of the utmost importance to every man and woman. The most important question in the world is the troubled query in the book of Job: "If a man die, shall he live again?" And the second in importance is the one propounded to Jesus by the rich young man: "What shall I do to inherit eternal life?" This chapter is intended as some kind of an humble answer to this second question, couched in modern language and phrased in the terminology of Science and Reason.

XVIII

THE DIVINE PURPOSE

ALL preceding chapters have dealt with the Divine Plan of things.

Some things have been said which seem to be very much in the nature of wild speculation; but this seeming may be largely due to the fact that in saying those things Religion has been examined from the standpoint of Science, the endeavour being to bring some of the "unknown" things into the realm of the known, and to show that many of the "unknowable" things ought more properly to be catalogued merely as "unknown." So long have men and women supposed that Religion is made up of doctrines and dogmas concerning very mysterious things which God has securely concealed from human understanding, that any effort to gather some of the facts and correlate them into a rational system will quite naturally appeal to them, at first thought, as being mere speculations, notwithstanding the well-known facts upon which the system may be based, and its powerful appeal to Reason, Intuition and Conscience.

FUNDAMENTAL HYPOTHESES

Let it be again and finally understood that this book rests upon only two fundamental hypotheses,

viz.: an all-pervading Force moving in the form of complex waves through the omnipresent ether, which, beginning with a state of gaseous incandescence, has created and evolved, and still creates and evolves, everything in the world; and a realm of matter, called spiritual matter, which is finer in particle than the physical, which in some of its forms interblends with every physical entity and forms a counterpart of it. Everything which has been said rests squarely upon one or the other of these two postulates, and the entire book is made up of a consideration of them in the light of scientific discoveries and world-old religious beliefs. These intuitional and rather irrational beliefs, and these sporadic and largely unsystematized scientific discoveries, come far short of being all that might be desired in the way of light; but none other is available, and against the time when "that which is perfect shall have come" we must be content to "see as through a glass, darkly." This book is a pioneer in the field it attempts to occupy, and, like all pioneers, it must needs be more or less crude. Many writers and thinkers have dealt severally with the subjects that have here been treated, and some have dealt with a number of them collectively; but there seems to have been no previous effort to coördinate the fundamental aggregate of scientific discoveries with the fundamental aggregate of religious beliefs, and to mould them into a scheme of things having a beginning, working according to a plan, and moving towards the accom-

plishment of a purpose. The task is admittedly a stupendous one for an humble finite mind, and the opportunities for minor mistakes of reasoning and errors of deduction are many; but the author is convinced that the two fundamental postulates can never fall, and if this be true then minor mistakes and errors are of no particular importance.

REVIEWING THE FACTS

From time to time, in the course of considering the Worker and His Plan, we have had fleeting glimpses of His Purpose. An effort will be made in this closing chapter to make that Purpose more fully to appear.

Limiting consideration, in point of space to this world and its environs, and in point of time to the ages which have passed since the world first flamed out in the firmament as a fiery cloud-ball of gases, we have seen how a mighty Intelligent Force, moving upon matter from without in the form of complex ether-waves, caused its atoms to unite into the solid earth, and then proceeded to build up and evolve all of life and growth with which we are familiar in this age. We have also seen that this growth or evolution has been and is dual in operation, being the result of coöperation between two interblending realms of matter. We have seen that all aggregation, life, growth and evolutionary development, came through the establishment of harmonic vibratory rates between similar individual entities of opposite polarity, such harmony impel-

ling them to unite into refining and constructive matings. We have followed this great harmonic principle from the mineral kingdom to the human kingdom, noting its increasing scope and power as we proceeded from stage to stage. We have begun with the active and aggressive tendencies of the positive mineral atom, and following the trail of these tendencies through the vegetable and animal kingdoms, have come at last to Man, active, aggressive, and searching for Truth by the light of Reason. We have begun with the passive and yielding tendencies of the negative mineral atom, and following the trail of these tendencies through the vegetable and animal kingdoms, have come at last to Woman, passive, yielding, and seeking for Love in the light of Intuition.

When we thus arrived, in the course of consideration, at the estates of Manhood and Womanhood, we found them also responding to the same mighty Force which had impelled all the entities below them. They, also, are generally attracted to each other by sheer force of the attraction of positive for negative and negative for positive. But this general attraction is not sufficient to produce Love-matings. It must be supplemented by harmonic vibratory rates in one or more of the departments of their respective beings, just as harmonic vibratory rates were necessary to bind mineral atoms together. But there are so many and more complex "departments" in the individual beings of men and women that harmony in all of those de-

partments is much more difficult to establish than in the mineral kingdom. We have already noted the rise of the law of Natural Selection, and observed that it became more discriminative at each forward step in the production of higher and more complex forms.

In order to produce an ideal mating between two human beings there must be harmony in the departments of the physical bodies, in the departments of the spiritual bodies, and in the departments of the minds, or souls. If these various harmonic requirements are to be met, or even closely approached, men and women must have a larger range of choice in selecting their mates than is required in the kingdoms below them. In actual practice attempts at mating are predicated, all too often, upon harmony in only one of these departments, and even in that department the harmony is not always perfect. These attempts at mating are predicated upon harmony in various departments of the two individuals, ranging from the physical body to the mind; but ideal matings, based upon harmonic relations in all departments of the individual beings, are at present very rare. Realizing this, we can readily account for all the domestic unhappiness and sorrow that men and women everywhere either silently endure or scandalously repudiate.

Having discovered that the Force which created the solid earth out of chaos, and which built up and evolved everything upon the earth, is the same

Force which produces the ecstatic happiness of perfect human love, we came face to face with the great fact that this Force is nothing other than God. We then discovered that the net result of all our tedious and high-tension mental processes is stated very simply in three little New Testament words of one syllable each, viz.: "God is Love." And so it is literally true, after all, that "In the beginning God created the heaven and the earth," and that "All things were made by him, and without him was not anything made that was made." It also seems to be true that after God had created Man and Woman, He "rested" from His creative labours. He had brought forth individuals so equipped as to be self-sustaining and self-evolving. Being able to reason, and to independently choose, they were constituted free moral agents, and their further evolution was made to depend upon whether or not they would comply with the laws and forces which had brought them thus far, and which were all-sufficient to carry them still further forward. He placed before them Good and Evil, and Life and Death, and left them free to choose for themselves. He gave them physical bodies for use during their studentship on the physical plane, and He gave them spiritual bodies for use on the spiritual planes. By the operation of immutable law their physical bodies sooner or later wear out and decay, and it rests entirely with them whether they will so live as to fit their spiritual bodies for a happy immortality in delight-

ful realms, or whether they will so live as to relegate those bodies to the regions of outer darkness and to the pains of a "second death."

Human love having been found to be the highest present individual manifestation of the God-Force which creates and evolves all things, it ought also to be true, if our major hypothesis of the all-pervading Force be correct, that this same love is a powerful factor in evolutionary advance and refinement, registering its effects upon the children of true love-marriages, as well as upon the parents themselves. That this latter is incontrovertibly true, a great abundance of evidence is ready at hand. In those countries where caste distinctions limit men and women in contracting marriage, and in those other countries where marriages are arranged by third parties, the human race has fallen behind in the evolutionary march. India and China furnish striking examples. The same is also true of the people of those countries where the sensuality of polygamy has choked true love. Turkey furnishes an example of this kind. Among those families whose members contract marriage as a matter of policy, the children are prone to be deficient. The old aristocratic families perish from the earth, and royalty degenerates.

To the limit that Eugenics undertakes to prevent reproduction by the hopelessly unfit, its work is constructive and conservative; but all of its efforts which tend to induce men and women to select mates merely upon the ground of their mental and

physical fitness are destructive and profligate. It were better that a child be born of defective parents who are really and truly in love with each other than that it be born of parents who are mentally and physically perfect, but who have merely patched up a cultured and refined truce under which they live together as husband and wife. Love has created and evolved everything in the world, from mineral molecule to man, and in all the kingdoms below the human it operates almost automatically. Man, being a free moral agent, endowed with the faculties of reason and choice, can cast love out of his personal equations; but whenever he does so he gets results which are bound to be disappointing. He may violate the laws of his being, but he thereby invokes penalties which are sometimes visited upon his children even "unto the third and fourth generation."

Since we are here considering Religion in its scientific aspects, and since marriage is one of its oldest and most sacred rites, it will not be out of place to give a little more detailed consideration to the scientific aspect of marriage itself. The basic principle has already been propounded; in fact that basic principle was propounded when the atoms of oxygen and hydrogen united into molecules of water; but we will now proceed to a brief consideration of the workings of that principle.

Some of the very ancient and very devout Christian artists painted a halo, or aura, as emanating from the body of their patron saint; and this cus-

tom is more or less in vogue at the present time, although it has long been considered as merely a token of veneration and respect. Now, however, in the light of modern scientific discoveries, there has arisen a question as to whether the halo or aura may not be true to life. We have often met people whose very presence was distastefully disturbing, and for no apparent reason. The presence of other persons is pleasant, running in degree from "pleasing personality" to "love at first sight." There must be a scientific reason for these things.

At the time of this writing it has recently been announced through the public prints that a French scientist has wrought out a chemically treated "screen" which he interposes in a camera between the photographic plate and the subject, and by means of which he has been able to photograph the "magnetic radiations" from the human body. The report goes on to say that these radiations are very similar in general appearance to the halo in ancient paintings and bas-reliefs, and that they vary greatly in extent and appearance in photographs of different people. This report may turn out to be merely "newspaper talk," but it is interesting, to say the least of it. According to one of the minor deductions of a previous chapter there must be an induced magnetic "field" in the physical body which acts as a tie between it and the interblending spiritual body; and if there be such a magnetic field it would necessarily radiate beyond the surface of the magnetized body, just as do all other magnetic

fields. Such radiation would also necessarily vary in form and extent in different individuals, according to different states of vitality, mental attitudes, etc. Therefore, if the learned Frenchman has not actually photographed "haloes" it is just possible that he or some one else may yet do so. If we but pause here to realize that such terms as "animal magnetism," "personal magnetism," and "magnetic personality," are very commonly and generally used by people in all walks of life, this effort to get at the very facts may not seem so strained or far-fetched.

It may now be realized that each individual human body has its own peculiar magnetic "body-tone"; which, being interpreted in the terminology of Music, means the master-key with which all the minor magnetic vibrations of the body are pitched in harmony. These body-tones would naturally vary in different individuals, the range of variation being almost as wide as is the variation in personal appearance. Man and Woman are attracted to each other in a general sort of way by reason of tendencies to opposite polarity. When it is said that men and women tend to opposite polarity, it is not meant that they literally and physically attract each other as the positive pole of a magnet would attract the negative pole of another magnet. When we come to consider the estates of Man and Woman, we have progressed very far away from the heavy and sluggish forces which impel the phenomena of the mineral kingdom. It

is only intended to say that there is something in the active, aggressive nature of Man which fills the same place in the human realm as positive polarity fills in the mineral kingdom, and that there is something in the passive, yielding nature of Woman which fills the same place in the human realm as negative polarity fills in the mineral kingdom. We do not know just what this something is, but it was traced, in a preceding chapter, from the mineral kingdom to the human kingdom, and some of its principal manifestations in each kingdom were there discussed. It is called "polarity" because it is a link in the chain of which mineral polarity is a part, and because no better name has been found for it.

If the general attraction existing between an individual man and an individual woman chances to be supplemented by harmony between their respective magnetic "body-tones," the attraction is vastly increased. A great many legal marriages are contracted upon the basis of this one harmony alone, all the other departments of the two individuals being more or less in discord. Such marriages bring some measure of happiness for a time, but the several discords will eventually result in mental states and attitudes which will break down the one harmony, and then the matter resolves itself into a choice between the divorce court and "toughing it out for the sake of the children."

In the present state of human development men and women are compelled to more or less "leap in

the dark" in settling these personal problems. Love is their only guide, and true love will never lead them astray. The danger lies in mistaking partial harmony for complete harmony, and in mistaking near-harmony for exact harmony. Marriages should not be contracted in haste, and all attractions should be carefully analyzed in the light of Reason and Intuition. These are the only precautions that can be taken at the present time.

Young people should carefully examine and rationally analyze the ecstatic feeling which fires them when they meet those of the opposite sex who are in some way attuned to them. Harmony even between their physical natures may produce what to them appears to be true love, but marriage based upon such harmony alone will result in disaster.

If a man and a woman are unhappily married, and if the coming of children has cast upon them the moral obligation to remain together for the sake of these innocent third parties, they may find much greater happiness than they imagine to be available by coming to mutual understanding upon as many points and grounds as possible; because each bond of sympathy and understanding tends to create other bonds of the same kind.

THE PURPOSE REVEALED

When we had reached the end of our reasoning as to the Divine Plan, we came at last to Man and Woman, and we there paused to contemplate the ideal which is so often and so nearly approached.

And again, at the end of our reasoning as to the Divine Purpose, we come at last to Man and Woman. All too often the individuals of this present age and realm are marred by ignorance and sin and disease, but nothing short of the ideal can satisfy the Divine Purpose. Some time, somewhere, somehow, this ideal must be wrought out in each individual who shall persist until that time, place and end. And so it is that we again contemplate the ideal, and look to these two wonderful beings as they stand before us in all the splendid grandeur of their strength and beauty; inherently divine in their essential natures; collaborators of the great God of all being; endowed with the faculties, capacities and powers requisite to working out and enjoying a mutual and most ecstatic happiness; possessed of the secret of immortality; and holding passports to the kingdom of heaven. So unlike are they, this aggressive Searcher for Truth and this yielding Seeker of Love! and yet with their mutual destinies and happiness so closely bound up together! Their physical bodies may grow old and decay, but their souls shall remain forever young, and in the spiritual realm "they shall renew their strength like eagles." In the world towards which they move they will be free from many of the things which have marred and blighted them here, and will learn to invoke the operation of wonderful laws and forces which will enable them to become masters of their own destinies. As we contemplate them thus, can we won-

der that the great and all-creative God, imbued with all wisdom and endowed with all power, was content to rest from all His labours when He had evolved them? It is a far backward cry from them to the fiery cloud-ball, with many tedious millions of years intervening; but does not the result glorify the Plan and justify the means? and would we change the Purpose if we could?

A beautiful land on high, where "there shall be no more death, neither sorrow, nor crying, neither shall there be any more pain," inhabited by such as these "made perfect in love"! A land of glorious opportunity, where happy dreams come true and hopes are realized, still further glorified and gladdened by the talents, arts and goodness of the great and good men and women of all ages! This seems to have been the Purpose with which the all-pervading, all-creating God-Force moved upon gaseous incandescence, and for the accomplishment of which it has striven throughout the intervening eons of time.

How do the petty cares and worries and sorrows of earth fade away before the light of this resplendent vision! How paltry is all of wealth, and pomp, and heraldry, and power, when compared with the infinite richness of a treasure such as this!

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